

**CLASS 252, COMPOSITIONS****SECTION I - CLASS DEFINITION**

(A) Compositions of matter, having or not having structure, physical form or heterogeneous arrangement of components and for which there is no provision elsewhere.

(B) Packages of such compositions, or other articles which include such compositions for which there is no provision elsewhere.

(C) Processes of making, or peculiar to making, such compositions and for which there is no provision elsewhere.

(D) Apparatus for use in or peculiar to such processes and for which there is no provision elsewhere.

- (1) Note. In this class each composition, the processes that are peculiar to making the same, and apparatus that is peculiar to such processes, are classified on the whole composition and its complete, or primary, function or quality, and such processes and apparatus are classified on or with the corresponding composition, unless otherwise indicated.
- (2) Note. Elements other than C and H and compounds which contain such other elements are not considered to be significant in this class when they originate in and form a part of petroleum, or fractions thereof, unless such elements or compounds are separately recited in the claims.
- (3) Note. The term "metal" as used in this class includes As, Sb, Bi, but not B, Si, Se, or Te. The terms "carboxyl" and "carboxylic", as used in this class, refer to the radical - COO-.

**SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS****A. LINE BETWEEN THIS CLASS, SUBCLASSES 380+ AND THE COMPOUND, ETC., CLASSES**

Compositions that recite a chemical compound or element in combination with an agent or agents whose sole purpose is to prevent chemical or physical change (e.g.,

caking) in the compound or element, or to prevent corrosion by the compound or element, are classified with the compound or element. Processes of preparing such compositions, and processes of thus preserving the compound or element or preventing corrosion by the compound or element are also classified with said compound or element.

Class 252, subclasses 380+ take (1) old compounds limited to use as preserving agents, and (2) the combination of a preserving agent with a substance preserved wherein said substance preserved is so broadly claimed as not to afford a basis of classification, e.g., "an organic substance."

**B. COMPOSITION CLASS SUPERIORITY**

The rules for determining class placement of the original reference (OR) for claimed chemical compositions are as follows.

When all claims are in the same main class (i.e., a class and the classes that are an integral part therein are a single main class), placement of the OR is determined by the first occurrence in that main class schedule.

Placement of the OR when claims are classified in different main classes is controlled by the most comprehensive claim. When there are two or more claims that are equally most comprehensive and said claims are classified in different main classes, class placement of the OR is determined among said claims by first occurrence in the hierarchy set forth below in the ORDER OF SUPERIORITY FOR COMPOSITION CLASSES. Class 252, subclass 1, MISCELLANEOUS, is the residual placement subclass for claimed compositions whether or not of any special use, property, or function, not provided for elsewhere in the US Patent Classification System.

For purposes of determining class placement of the OR, a composition claim is either (1) classifiable per se, i.e., recites in the claim a special use, property, or function which is provided for by the title and definition of a class or subclass; or (2) not classifiable without recourse to the specification, i.e., does not recite in the claim a special use, property, or function provided for by the title and definition of a class or subclass.

If one or more composition claims are classifiable without said recourse to the specification, such claim or claims will control OR placement according to the first occurrence in the hierarchy set forth below in the ORDER OF SUPERIORITY FOR COMPOSITION

**CLASSES.** Any claims for which said recourse is necessary will be placed as cross-references on the basis of the classification determined by recourse to the specification. The exception to this placement rule is that, if the definition of a class or subclass explicitly provides for “solely disclosed” subject matter (usually a special use) of that class or subclass, class placement of the OR is that class or subclass if there is “solely disclosed” class or subclass subject matter. Examples of classes which provide for “solely disclosed” subject matter include Classes 424, 426, 508 and 510.

Examples of classes and subclasses which provide for compositions without a special use basis include Classes 106, 208, 252/363.5, 252/367.1, 252/372+, 252/378, 420, 501, 516, 520, 530, and 585. In the case of one or more composition claims classifiable in such a class or subclass, class placement of the OR is determined by first occurrence in the hierarchy set forth below in the **ORDER OF SUPERIORITY FOR COMPOSITION CLASSES** for claims classifiable without recourse to the specification for disclosed special use/s.

If ALL composition claims are not classifiable without said recourse to the specification, then each unclaimed disclosed special use, property, or function will be treated as though recited in a separate claim and Class placement of the OR is determined by first occurrence in the hierarchy set forth below in the **ORDER OF SUPERIORITY FOR COMPOSITION CLASSES**.

Any explicit statement of a class line or relationship between classes, set forth in a class (or subclass) definition or note, will be followed even if in conflict with the hierarchy set forth below in the **ORDER OF SUPERIORITY FOR COMPOSITION CLASSES**.

#### **ORDER OF SUPERIORITY FOR COMPOSITION CLASSES**

504, Plant Protecting and Regulating Compositions.

424, Drug, Bio-Affecting and Body Treating Compositions.

514, Drug, Bio-Affecting and Body Treating Compositions (integral part of Class 424).

426, Food or Edible Material: Processes, Compositions, and Products.

71, Chemistry: Fertilizers.

435, Chemistry: Molecular Biology and Microbiology.

436, Chemistry: Analytical and Immunological Testing, subclasses 500 through 548, in the schedule order.

505, Superconductor Technology: Apparatus, Material, Process, subclasses 100+.

149, Explosive and Thermic Compositions or Charges.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof.

508, Solid Antifriction Devices, Materials Therefor, Lubricant and Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions (integral part of Class 252).

44, Fuel and Related Compositions.

148, Metal Treatment, subclasses 22+.

252, Compositions, subclasses 2 through 611, in the schedule order.

507, Earth Boring, Well Treating, and Oil Field Chemistry (integral part of Class 252).

252, Compositions, subclasses 8.57 through 88.2, in the schedule order.

510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions (integral part of Class 252).

252, Compositions, subclasses 175 through 194, in the schedule order.

502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making (integral part of Class 252).

252, Compositions, subclass 478 through 407, in the schedule order.

436, Chemistry: Analytical and Immunological Testing, subclasses 1 through 183, in the schedule order.

252, Compositions, subclass 408.1 through the end of the schedule (except Class 516, or subclasses 363.5, 367.1, 372+, or 378, for which see below).

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers.

429, Chemistry: Electrical Current Producing Apparatus, Product and Process.

205, Electrolysis: Processes, Compositions Used therein, and Methods of Preparing the Compositions (integral part of Class 204).

204, Chemistry: Electrical and Wave Energy.

106, Compositions: Coating or Plastic, subclasses 1.05 through 38.9, in the schedule order.

501, Compositions: Ceramic.

106, Compositions: Coating or Plastic, subclasses 600 through 316, in the schedule order.

51, Abrasive Tool Making Process, Material, or Composition.

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 300+.

420, Alloys or Metallic Composition.

148, Metal Treatment, subclasses 400+.

520, Synthetic Resins or Natural Rubbers,

530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, subclasses 200+ and 500+.

208, Mineral Oils: Processes and Products.

512, Perfume Compositions.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting (integral part of Class 252).

252, Compositions, subclasses 363.5, 367.1, 372+, and 378.

423, Chemistry of Inorganic Compounds, subclasses 265+.

585, Chemistry of Hydrocarbon Compounds (see the mixture subclasses).

252, Compositions, subclass 1 residual location for unprovided compositions.

This superiority list is not necessarily a complete list and will be amended as the relationship between other Classes containing compositions and the above listed Classes is determined.

#### C. LINES FOR PARTICULAR CLASS 252 SUB-CLASS AREAS.

##### 1. Lines Pertinent to Subclasses 62.51+

##### a. Lines With Class 148, Metal Treatment:

Subclasses 62.51+ take processes of preparing magnetic compositions and the compositions resulting therefrom, as well as such processes followed by a magnetizing and/or broad molding step. Subclasses 62.51+ also take any combination of the aforementioned steps with a heat-treating operation, except where the heat treatment modifies a magnetic property of a metallic component which is intentionally present in the composition, in which case the process is classified in Class 148.

Class 148, subclasses 100 through 122 take processes for altering the magnetic properties of materials having at least one component which is a free metal or alloy, except as indicated in the (2) Note in Class 148, subclass 100. Subclasses 300+ in Class 148 provide for stock resulting from such processes.

Dust cores made from a Class 252 component, but containing an intentionally included metallic component, whose magnetic properties have been modified by heat treatment, are provided for in one of said subclasses 300+.

##### b. Lines With Classes 29, Metal Working and 264, Plastic and Nonmetallic Article Shaping or Treating: Processes:

Class 29 provides for making magnets or cores for electromagnets from comminuted materials, including from mixtures of nonmetallic plastic materials and comminuted metals or magnetic nonmetals. Subclasses 602.1+ of Class 29 provide for methods of manufacturing magnets from nonmetallic materials which recite some step in addition to one or more of the following: making the composition, molding, heat treatment, and magnetizing. Processes restricted to any or all of the four named operations are classified in this subclass, 62.51+, of

Class 252, except if significant molding steps are recited.

If significant molding steps are recited, the process is classified in appropriate subclasses of Class 264, particularly subclasses 61, 104+, and 272. Class 264 provides for working, shaping, or molding of plastic materials which may be disclosed to be a magnetic compositions. See the Class Definition of Class 264 for the general lines between Class 264 and the composition classes.

c. Lines with Class 210, Liquid Purification or Separation:

Class 210 is the locus for the separating or purification of a liquid, generally claimed and for the separation, purification, or treatment of water, specifically. Class 252 is the locus for the resolution of colloids and will take the separation of liquids, generally claimed, by breaking an emulsion and including ancillary steps as decanting or passing through a separatory funnel, etc. Class 210 will take (a) a step of emulsion breaking of liquids generally claimed, combined with the separation of a diverse component (unless also by emulsion breaking), or (b) a step of emulsion breaking, per se, for the purpose of obtaining water. The water may be intended for use of for disposal.

d. Lines with Classes 106, Compositions: Coating or Plastic and 520, Synthetic Resins or Natural Rubbers:

Thus a composition which would otherwise be classified in Class 106, or in the Class 520 series would be classified herein if it is claimed as being electrically conductive or emissive or is so disclosed and the claims are generic as to the composition. As to methods of preparing the composition or device, this and indented subclasses will take those methods ordinarily classified in Class 106 within the limits set forth in section IV and (4) Note of the class definition of Class 106. The same limitations apply as between these subclasses and Class 260.

e. Lines with Class 250, Radiant Energy :

The line between Class 250 and this and indented subclasses is that Class 250 takes radioactive compositions combined with apparatus (structure); whereas Class 252, subclasses 625+ are limited to compositions, per se, or devices (structure) defined only in terms of their composition.

The line between Class 250 and Class 252, subclasses 625+, is that Class 250 takes radioactive compositions

combined with apparatus (structure); Class 252, subclasses 625+, on the other hand, is limited to compositions, per se, or devices (structure) defined only in terms of their compositions.

### SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS

SEE OR SEARCH THIS CLASS, SUBCLASS:

61, 175, 179, 193, 319, 410, and 427 for Search Class references to Liquid Purification or Separation, for separation processes and apparatus there provided for.

### SECTION IV - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers. See the main class definition for the compositions classified therein.
- 15, Brushing, Scrubbing, and General Cleaning, for dust cloths, mops or other cleaning devices which include detergents.
- 44, Fuel and Related Compositions, appropriate subclasses for a solid or gelled composition to be used either as a fuel or as a carbonaceous reductant in a metallurgical process, subclass 643 for a match scratcher composition or structure, subclasses 640, 641 or 642 for a composition which, when present with a burning solid fuel retards or removes wall deposits, improve the combustion properties of the fuel or colors the flames, respectively, and subclasses 300+ for liquid fuel.
- 48, Gas: Heating and Illuminating, for gaseous compositions for heating or illuminating by combustion.
- 51, Abrasive Tool Making Process, Material, or Composition, for a composition for grinding, polishing, or abrading.
- 60, Power Plants, see class definition, search note to this class for the line between Class 60 and this class.
- 62, Refrigeration, see class definition, search note to Class 252, Compositions, for the line.
- 71, Chemistry: Fertilizers, for a plant fertilizing composition.
- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal

- Powder Compositions, and Loose Metal Particulate Mixtures, for processes of obtaining free metals from metal compounds, ores, or mixtures, or preparing materials for such processes, or compositions for use in such processes, and for alloys and other compositions having a continuous phase of free metal, e.g., made from metal powder.
- 99, Foods and Beverages: Apparatus, for apparatus for making food compositions.
- 106, Compositions: Coating or Plastic, for coating or plastic compositions and materials or ingredients used in the making of coating or plastic compositions which are not elsewhere classified. See References To Other Classes in Class 106 for coating or plastic compositions classified in classes other than those in Class 106. In particular, see the reference to Class 252 for the line between Classes 106 and 252.
- 117, Single-Crystal, Oriented-Crystal, and Epitaxy Growth Processes; Non-Coating Apparatus Therefor, for processes and non-coating apparatus for growing therein-defined single-crystal of all types of materials, including inorganic or organic.
- 127, Sugar, Starch, and Carbohydrates, for processes and apparatus for refining and manufacturing sugar, starch and carbohydrates and for the products produced.
- 131, Tobacco, for tobacco compositions and tobacco substitute compositions.
- 134, Cleaning and Liquid Contact With Solids, for washing or cleaning processes, which include use of detergents, or apparatus therefor or for contacting liquids with solids.
- 148, Metal Treatment, for soldering or other fluxing compositions, compositions for use in tempering or otherwise modifying solid metal.
- 149, Explosive and Thermic Compositions or Charges, for explosive and thermic compositions where the latter are used to produce usable heat or flame and by-products resulting from the use of such compositions.
- 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, Class 252 provides for etching agents, per se, and for single crystal compositions within the class definitions, especially subclass 62.3 for barrier layer compositions.
- 162, Paper Making and Fiber Liberation, appropriate subclasses, for chemical processes of liberating cellulose and other fibers from fibrous materials, for processes of making paper by depositing fibers from a liquid suspension and for compositions employed in such processes.
- 166, Wells, subclasses 244.1+ for processes of treating or operating a well. See the Notes and Search Class references therein.
- 169, Fire Extinguishers, for fire extinguishing processes.
- 184, Lubrication, for lubricating devices and processes.
- 201, Distillation: Processes, Thermolytic, appropriate subclasses, for a carbonizing process and subclass 20, 21+ and 25 for special carbonaceous compositions used in thermolytic distillation.
- 202, Distillation: Apparatus, appropriate subclasses for apparatus for making or reactivating solid carbonaceous sorbents.
- 203, Distillation: Processes, Separatory, appropriate subclasses for a distillation process not otherwise provided for.
- 204, Chemistry: Electrical and Wave Energy, for processes involving electrolysis, producing chemical changes by use of electrical or wave energy, involving electrophoresis or electro-osmosis, or electrical separation or purification of liquids including emulsion breaking and resolving other colloid systems. Compositions which are the result of a wave energy process are classified with the art use of said composition.
- 208, Mineral Oils: Processes and Products, for processes of cracking, distilling, purifying or otherwise treating mineral oils or tars or the products of such processes including lubricants, heat-exchange hydraulic and dielectric or electrical resistance compositions that are purely mineral oil or tar products, or mixtures thereof without any added specifically recited chemical compound or element.
- 216, Etching a Substrate: Processes, for etching processes.
- 239, Fluid Sprinkling, Spraying, and Diffusing, for processes or apparatus for dispersing liquid gases, especially subclass 8, 9, 337+, and 398+.
- 260, Chemistry of Carbon Compounds, for compositions containing a natural rubber and for an organic compound, or a composition of an organic compound and an agent for inhibiting caking of, corrosion by chemical decomposition of, or other chemical changes of, the carbon compound, or processes of so preserving such compounds.

- 366, Agitating, and the notes thereto for processes and apparatus for mixing materials by agitation. Manipulative mixing processes for compounding a composition from a plurality of ingredients are properly classifiable in Class 366 only if the ingredients are not sufficiently identified to form a basis of classification in this class (252) or other appropriate composition classes.
- 376, Induced Nuclear Reactions: Processes, Systems, and Elements, appropriate subclasses especially subclasses 156+ for the production and/or utilization of radioactive substances and compositions.
- 401, Coating Implements With Material Supply, subclass 49 for a piece of self-sustaining coating material having a shaped end for rubbing contact with a workpiece.
- 404, Road Structure, Process, or Apparatus, appropriate subclasses, for (1) highway, pathway or walkway structure, per se; and (2) process and apparatus for making, installing, repairing or maintaining such structure-where such structure, process or apparatus is not otherwise classifiable as either (a) specifically provided for in other loci or (b) of such general utility as to be provided for on that basis (See Subclass References to the Current Class and References to Other Classes in the Class 404 Class Definition for known collections of such nature and the particular lines of demarcation).
- 420, Alloys or Metallic Composition, appropriate subclasses for alloys, intermetallic compounds and metallic compositions. See Class 420, Lines With Other Classes and Within This Class, for an elaboration of the line between Class 420 and this class (252).
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclass 55 for litmus and other test papers and analogous devices; also appropriate subclasses for apparatus employing catalysis.
- 423, Chemistry of Inorganic Compounds, appropriate subclasses for inorganic compounds and nonmetallic elements, including processes for their manufacture, and note especially subclasses 265+ for inorganic compounds and nonmetallic elements which include an additive whose sole function is to preserve the compound or element. For a further statement of the lines between this class and Class 423 see the notes in 423.
- 424, and 514, Drug, Bio-Affecting and Body Treating Compositions, appropriate subclasses for: compositions (A) for preventing, alleviating, treating or curing abnormal and pathological conditions of the living body, for maintaining, increasing, decreasing limiting or destroying a physiologic body function, for diagnosing a physiological condition or state by an in vivo test, for controlling or protecting an environment or living body by attracting, disabling, inhibiting, killing, modifying, repelling, or retarding an animal or micro-organism, (B) for deodorizing, protecting, adorning, or grooming a body, (C) for fermentates and extracts for use in A or B and not elsewhere provided for, and (D) such compositions defined in terms of specific structure; methods of making the above compositions; methods of using the class defined compositions for purposes in A and B; and methods of using compounds, per se, for purposes in A and B.
- 426, Food or Edible Material: Processes, Compositions, and Products, for food products, compositions and processes of treating same.
- 427, Coating Processes, for coating processes in general and see the class definition of Class 427 for the general line between Class 427 and the composition classes.
- 428, Stock Material or Miscellaneous Articles, main Class Definition, Lines With Other Classes and Within This Class, Compounds and Compositions, for the distinction between a composition and a stock material, and also subclasses 544+ for a stock material which is all metal or has adjacent metal components, particularly subclasses 546+ for composite stock having a particulate metal component.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclasses 105-111.41 for developing composition or products for electric or magnetic imagery and subclass 137.22 for processes of making the developing compositions.
- 435, Chemistry: Molecular Biology and Microbiology, for processes of making chemical compounds which include fermentation or ferments or other compositions for use in such processes or processes of making them.
- 436, Chemistry: Analytical and Immunological Testing, for chemical testing compositions including test standards.

- 504, Plant Protecting and Regulating Compositions, for a plant stimulating or eradicating composition and especially subclasses 150+ for an algicidal composition.
- 505, Superconductor Technology: Apparatus, Material, Process, subclasses 100+ for high temperature ( $T_c$  30 K) superconducting materials, per se, or subclasses 300+ for processes of producing same. **3** This subclass is indented under subclass 2. Compositions which are, or contain, foams or gas phases or processes of making the same.
- 520, Synthetic Resins or Natural Rubbers, for synthetic resins, per se, and for resin containing compositions, the use or utility of which is not specifically provided for elsewhere. See Lines With Other Classes and Within This Class in the Class Definition of this class (252) above. SEE OR SEARCH THIS CLASS, SUBCLASS:
- 585, Chemistry of Hydrocarbon Compounds, subclasses 1+ for a composition consisting of only hydrocarbons, at least one component of which is a nonmineral oil hydrocarbon, or a composition of a hydrocarbon with an agent for improving the general properties of such hydrocarbon. See Lines With Other Classes and Within This Class in the Class Definition of this class (252) above. 6+, and 7, for fire extinguishive compositions containing components for producing foams.
- 8, for gas-charged liquids or processes of making them for extinguishing fires.
- 61, for compositions for producing foams for froth flotation.
- SEE OR SEARCH CLASS:
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

## SUBCLASSES

- 1** This subclass is indented under the class definition. Compositions for which there is no provision elsewhere in this class (e.g., artificial snow). **4** This subclass is indented under subclass 2. Compositions which contain components for generating gas by chemical reactions, substances peculiar thereto or processes which include such reactions.
- 2** This subclass is indented under the class definition. Compositions specialized and designed for or peculiar to use in extinguishing fires or processes of making them. **5** This subclass is indented under subclass 4. Compositions which contain components for generating gas by combustion of such components, substances peculiar thereto, or processes which include such combustion.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 381+, for compositions for forming protective coatings, layers, or zones for excluding air or other substances. **6** This subclass is indented under subclass 4. Compositions which contain components for generating gas by chemical interreaction of such components, substances peculiar thereto, or processes which include such interaction.
- SEE OR SEARCH CLASS:
- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclass 96 for compositions for forming protective coatings, (1) Note. Claims which are drawn to compositions which are chemically decomposable by heat to form a fire extinguishive gas, but do not contain

individually components which are adapted to chemically interreact to produce a gas are not classified in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 3, for fire extinguishive foams.
- 61, for compositions for making foam for froth flotation.

SEE OR SEARCH CLASS:

- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

- 6.5** This subclass is indented under subclass 6. Compositions which contain agents for stabilizing foams or other colloid systems and processes of making them.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 3, 8.05 and 61, for other compositions containing foam stabilizing agents.

SEE OR SEARCH CLASS:

- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

- 7** This subclass is indented under subclass 4. Compositions which contain carbonates, ammonium compounds, or other substances which are adapted to generate gas by heat-decomposition thereof, substances peculiar thereto or processes which include such heat-decomposition.

- 8** This subclass is indented under subclass 2. Compositions which contain volatile nonflammable liquids (other than water) or liquids charged with gases, the gases being dissolved or liquefied, or processes of making the same.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 3, for fire extinguishive compositions which contain foams or gas phases.

SEE OR SEARCH CLASS:

- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

- 8.05** This subclass is indented under subclass 2. Compositions which contain agents for stabilizing foams or other colloid systems, and processes of making them.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 3, 6.5, and 61, for other compositions containing foam stabilizing agents.

SEE OR SEARCH CLASS:

- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

- 8.57** This subclass is indented under the class definition. Compositions for treating leather or fur not more specifically provided for elsewhere.

- (1) Note. Patents which claim a composition falling within this subclass and also claim (a) processes involving no more than the mere application of a composi-



tion to leather or fur and/or (b) a leather or fur product characterized essentially by the application of the composition are classified herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8.61, through 8.91, for textile treating compositions.  
601+, for compositions for fireproofing leather or hide.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 404+ for leather or fur dyeing compositions, and subclasses 94.1+ for (1) tanning compositions, (2) compositions which chemically react with a hide, skin, or fur, and (3) compositions for treating untanned hides or skins and are not more specifically provided for elsewhere.  
106, Compositions: Coating or Plastic, for leather coating compositions.  
424, Drug, Bio-Affecting and Body Treating Compositions, for a composition for destroying or repelling a pest and which may be used to coat or saturate leather or fur.  
510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, particularly subclass 275 for cleaning compositions for leather or fur.  
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in

breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

#### **8.61 DURABLE FINISHES FOR TEXTILE MATERIALS, OR PROCESSES OF PREPARING (E.G., CREASE RESISTANT, MOISTURE ABSORBENT, ANTI-STATIC, ETC., FINISHES):**

This subclass is indented under the class definition. Compositions specialized or designed for forming a lasting, nonfugitive finish on a textile substrate, such as fabric, yarn, or fiber, or processes of preparing the compositions.

- (1) Note. Formation of these durable finishes (e.g., permanent-press, etc.) usually requires an additional step, such as application of heat, in order to "set" the coating after application.
- (2) Note. Processes involving the mere use of a claimed composition are included in this and indented subclasses. If no composition is claimed or significant process steps are involved in addition to such mere use, the patent is classifiable in other appropriate classes.
- (3) Note. As used herein, the term "textile materials" includes fabrics (woven, knitted, etc.), yarn, filaments, and fibers.
- (4) Note. Patents including claims to both a composition and a textile material treated with the composition are classified in the class providing for the treated material and cross-referenced to this or indented subclasses.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 112 for caroting compositions and subclasses 125+ for mercerizing baths.

- 427, Coating Processes, appropriate subclasses for processes of producing durable finishes on textile materials.
- 428, Stock Material or Miscellaneous Articles, appropriate subclasses, particularly subclasses 224+ and 357+, for textile materials carrying durable finishes.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, subclasses 515+ for nondurable antistatic compositions used in the course of a laundering operation or in a finishing step, such as rinsing or drying, accompanying laundering.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

**8.62 Oil or water repellent or soil resistant or retardant:**

This subclass is indented under subclass 8.61. Compositions adapted to form on the substrate treated therewith an oleophobic or hydrophobic finish, or one which prevents the adherence of soil, such as spilled food, to the substrate.

**8.63 Textile softening:**

This subclass is indented under subclass 8.61. Compositions adapted to impart a soft feel or hand to the substrate treated therewith, other than laundry-use products.

**SEE OR SEARCH CLASS:**

- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, subclasses 276+ for cleaning compositions for textile materials and subclasses 515+ for nondurable textile softening compositions used in the course of a laundering operation or in a finishing step, such as rinsing or drying, accompanying laundering.

**8.81 TEXTILE PROCESSING AID COMPOSITIONS, OR PROCESSES OF PREPARING (E.G., LUBRICANTS OR ANTISTATIC AGENTS FOR FIBER, YARN, FABRIC, ETC.):**

This subclass is indented under the class definition. Compositions specialized and designed to facilitate the processing of textile materials, such as the conversion of fibers, filaments, yarns, or fabrics into the finished product (such as thread or yarn; knitted, woven, or nonwoven fabric; or garment, carpet, blanket, etc.) whereupon the finish may be removed by such means as washing or scouring.

- (1) Note. Such finishes are applied to staple fiber or continuous-filament yarns in order to reduce the tendency toward breakage of the individual fibers or filaments making up the yarn when subjected to mechanical processing, such as spinning, twisting, winding, texturizing by crimping or false twisting, etc.
- (2) Note. Processes involving the mere use of a claimed composition are included in this and indented subclasses. If no composition is claimed or significant process steps are involved in addition to such mere use, the patent is classifiable in other appropriate classes.
- (3) Note. Patents including claims to both a composition and a textile material

treated with the composition are classified in the class providing for the treated material and cross-referenced to this or indented subclasses.

SEE OR SEARCH CLASS:

- 427, Coating Processes, appropriate subclasses, for processes of applying processing aid compositions to textile materials.
- 428, Stock Material or Miscellaneous Articles, appropriate subclasses, particularly subclasses 224+ and 357+, for textile materials carrying processing aid compositions.
- 508, Solid Antifriction Devices, Materials Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, for nontextile lubricant compositions
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

**8.82 For tire cord yarn, elastomeric filaments, or biologically innocuous or absorbable fibers**

**(e.g., spandex, textiles used in food packaging, absorbable surgical sutures, etc.):**

This subclass is indented under subclass 8.81. Compositions specialized for use on tire-reinforcing yarn or cord; elastomeric filaments, such as spandex; or fibers exhibiting harmlessness to, or absorbability by, the tissues of a living organism.

**8.83 Sizing agents (e.g., for weaving yarn, etc.):**

This subclass is indented under subclass 8.81. Compositions specialized for maintaining the integrity of fibers or filaments making up a thread or yarn while it is being converted into a fabric, such as by knitting or weaving, or of threads or yarn making up a fabric which is being converted into a finished article by sewing or other means.

**8.84 For textile materials consisting wholly or in part of noncellulosic synthetic fibers (e.g., spin finish for nylon, polyester, acrylic, etc., fibers; lubricants for blends thereof with diverse fibers, etc.):**

This subclass is indented under subclass 8.81. Compositions wherein the textile material includes or consists of polymeric fibers which are synthesized from starting materials other than cellulose or its derivatives and are sometimes referred to as man-made fibers.

- (1) Note. A spin finish, which is generally applied immediately after extrusion of the polymeric filament and prior to drawing, comprises a combination of a lubricant/antistatic agent system. The finish facilitates subsequent processing of the filaments into yarn at very high speeds, involving the generation of electrostatic charges and friction, by preventing breakage of or damage to the filaments.
- (2) Note. Included in this subclass are blends of two or more synthetic fibers and blends of a synthetic fiber with animal hair, silk, or cellulosic fiber.

**8.85 For textile materials consisting wholly or in part of animal hair fibers (e.g., wool, etc.):**

This subclass is indented under subclass 8.81. Compositions wherein the textile material includes or consists of fibers which are the hair or fur of an animal, such as vicuna.

- (1) Note. Included in this subclass are blends of two or more animal hair fibers and blends of an animal hair fiber with silk or cellulosic fiber.

**8.86 For textile materials consisting wholly or in part of silk or cellulose-based fibers (e.g., cotton; artificial silk, such as rayon, cellulose acetate, etc., or blends thereof; silk soaking compositions; etc.):**

This subclass is indented under subclass 8.81. Compositions wherein the textile material includes or consists of silk fibers or fibers of cellulose or its derivatives.

- (1) Note. Fibers made of regenerated cellulose (e.g., rayon) or of cellulose esters or ethers, such as cellulose acetate, are sometimes referred to as semisynthetic fibers or artificial silk.
- (2) Note. Included in this subclass are blends of any one or more fibers with any other fiber under the subclass definition, such as linen, jute, hemp, etc.).
- (3) Note. Many compositions in this subclass facilitate processing by softening (making more flexible) the above fibers or materials made therefrom.

**8.91 COMPOSITIONS FOR ENHANCING THE APPEARANCE OF CONSUMER TEXTILE GOODS (OTHER THAN CLEANING COMPOSITIONS OR AUXILIARY COMPOSITIONS FOR CLEANING), OR PROCESSES OF PREPARING (E.G., ANTISTATIC OR WRINKLE-REMOVING SPRAY FOR GARMENTS, ETC.):**

This subclass is indented under the class definition. Compositions specialized or designed for increasing the positive visual impact of textile goods being used by a consumer, such as by reducing static cling or eliminating wrinkling by relaxing the fibers of an article of apparel, or processes of preparing the compositions.

- (1) Note. Processes involving the mere use of a claimed composition are included in this and indented subclasses. If no composition is claimed or significant process steps are involved in addition to such

mere use, the patent is classifiable in other appropriate classes.

**SEE OR SEARCH CLASS:**

510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, subclasses 276+, for cleaning compositions for textile materials; subclasses 515+ for textile softening or antistatic compositions used in the course of a laundering operation or in a finishing step, such as rinsing or drying, accompanying laundering.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

**60**

This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to, use in physically separating from each other, by froth-flotation or difference in specific gravity or rate of subsidence, two or more components of a mixture which differ from each other at least physically, or processes of making them.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

181.1+, for getter and gas or vapor generating compositions for electric lamps, electric space discharge devices and other evacuated or gas or vapor filled containers.

SEE OR SEARCH CLASS:

209, Classifying, Separating, and Assorting Solids, for processes or apparatus for using such compositions.

- 61** This subclass is indented under subclass 60. Compositions for use in separating components of mixtures by froth-flotations or in each case by selective or differential adherence of the composition, or agent containing the same, with respect to two or more of the components of the mixture.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

3, 6.5, 7, and 8.05, for foams, foamable liquids, and foam stabilizing or producing agents.  
88, for selective or differential particle-adherent compositions.

SEE OR SEARCH CLASS:

209, Classifying, Separating, and Assorting Solids, subclass 5, 45+, and 163+ for processes or apparatus employing such agents.  
210, Liquid Purification or Separation, subclasses 703+ for processes of precipitation involving flotation, and subclasses 198.1+ particularly subclasses 220+ for separators having means to add a treating material.  
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

- 62** This subclass is indented under the class definition. Compositions specialized and designed for use as heat or sound insulating or deadening materials, substances peculiar to such compositions, or processes of making the same.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, appropriate subclasses, particularly subclass 122, 601+ and 672+ for porous coating or plastic compositions.  
181, Acoustics, subclasses 284+ for a panel, web or sheet product with particular internal or external structure disclosed as being provided for the purpose of muffling sound.  
428, Stock Material or Miscellaneous Articles, appropriate subclasses for a stock material product in the form of a single or plural layer web or sheet which may inherently possess sound deadening or heat insulating properties; note especially subclasses 131+ for such a product including apertures, subclasses 297+ for such a product including a component containing structurally defined fibers, subclasses 304.4+ for such a product including a component which is porous or cellular, subclasses 323+ for such a product having a component containing structurally defined particles, subclasses 357+ for a mass or layer of a structurally defined or coated element (e.g., flake, particle, rod, strand or fiber); and subclass 920 (a cross-reference art collection) for a product having heat insulating properties.  
501, Compositions: Ceramic, subclass 39 and 80+ for pore-forming ceramic compositions.

- 62.2** This subclass is indented under the class definition. Compositions specialized and designed for use as an electrolyte for an electrolytic cell of the type which is used merely as an electrical circuit component.

## SEE OR SEARCH CLASS:

- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, for electrolytic processes and the electrolyte compositions used therein.
- 361, Electricity: Electrical Systems and Devices, subclasses 500+ for electrolytic devices, e.g., capacitors, rectifiers, not elsewhere classifiable, the electrolytes for which generally are found in this subclass (62.2).
- 429, Chemistry: Electrical Current Producing Apparatus, Product and Process, subclasses 188+ for battery electrolytes.

**62.3** This subclass is indented under the class definition. Compositions specialized and designed for use as one member of two members whose interface exhibits barrier layer properties.

- (1) Note. A barrier layer device is defined for the purpose of classification as an electrical component consisting of two conductors placed either in contact with each other or separated by an interface layer, to which contacts or terminals have been secured which component has a nonlinear resistance characteristic. The nonlinear resistance characteristic may be such that the device will pass current in one direction when the voltage is applied in one direction but will not pass any appreciable current when the voltage is applied in the other direction (e.g., rectifiers, electrolytic condensers), or will pass a proportionately different amount of current at different values of applied voltage. In the latter case, where the device passes a disproportionate amount of current, to be considered a barrier layer device the nonlinearity must arise as a result of the electrical action of the interface between the two conductors rather than from the characteristics of the conductors. For example, an electrical component having a resistance material which varies its resistance due to inherent changes in temperature with change in applied voltage is not a barrier layer device. Among the types of devices which may have a barrier layer are recti-

fiers, condensers, transistors and lightning arresters.

## SEE OR SEARCH CLASS:

- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclass .5 for single metals including those containing a nonmetallic constituent, subclass 236 for a composition having a continuous phase of free metal made by consolidating metal particles and containing carbide, and subclass 245 for such composition having a transition metal base.
- 117, Single-Crystal, Oriented-Crystal, and Epitaxy Growth Processes; Non-Coating Apparatus Therefor, for processes and non-coating apparatus for growing therein-defined single-crystal of all types of materials, including those which may be suitable as or to produce a barrier layer device. Class 118, Coating Apparatus, generally provides for coating apparatus, including single-crystal (e.g., epitaxy) coating means.
- 136, Batteries: Thermoelectric and Photoelectric, subclasses 236+ for thermoelectric batteries having a particular composition and at least two elements of the battery, particularly subclasses 238 and 239 for semiconductive type.
- 148, Metal Treatment, subclasses 33+ for layered stock material made from compositions of this subclass and for superlattice compositions.
- 257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), for devices which operate based on a barrier region or layer.
- 361, Electricity: Electrical Systems and Devices, subclasses 212+ for discharging or preventing accumulation of electric charge, and subclasses 500+ for electrolytic devices such as electrolytic condensers and rectifiers.

- 420, Alloys or Metallic Compositions, appropriate subclasses for single metals and alloys or metallic compositions and subclass 903 for a cross reference collection of alloys which are semiconductors.
- 428, Stock Material or Miscellaneous Articles, subclass 620 for metallic stock material having a semiconductor component.
- 438, Semiconductor Device Manufacturing: Process, for processes of making semiconductor devices utilizing compositions of this subclass.
- 62.51** This subclass is indented under the class definition. Compositions disclosed to be useful for magnetic purposes as well as compositions and processes for making same.
- (1) Note. This subclass takes processes of preparing magnetic compositions and the compositions resulting therefrom, as well as such processes followed by a magnetizing and/or broad molding step. It also takes any combination of these steps with a heat treating operation except where the heat treatment modifies a magnetic property of a metallic component which is intentionally present in the composition.
  - (2) Note. This subclass includes magnetic articles claimed in terms of the composition from which it is made, when said articles do not contain sufficient structural limitations to classify them elsewhere.
  - (3) Note. In some instances it is difficult to tell whether a fused mixture of oxides (e.g., ferrites) is a compound or a composition. If a claim of this type is restricted to atoms combined in definite, whole number ratios, the product is considered a compound. However, a patent not so limited; e.g., if the ratios of the elements are variable or "impurities" are intentionally present, is considered to be drawn to a composition classifiable in this or indented subclasses.
  - (4) Note. See section II, B, LINES WITH OTHER CLASSES AND WITHIN
- THIS CLASS in the Class Definition for this class (252), for a discussion of the lines between this subclass area and other classes.
- SEE OR SEARCH CLASS:
- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, appropriate subclasses for loose metal powder compositions and consolidated compositions having a random mixture of ingredients and a continuous phase of free metal, even when claimed as magnetic and/or nominally claimed as a rod, wire, strand, etc., especially subclasses 255+ for a composition of loose metal particles.
- 106, Compositions: Coating or Plastic, for strands, filaments and compositions distinguished solely by being made of plastic compositions (e.g., mixtures of metal powders and a plastic or coating composition). Such compositions are classified for the most part, in Class 106 in the subclasses entitled "With filler, dye or pigment". All magnetic compositions which would otherwise be classified in Class 106 are provided for in this subclass (62.51+) and its indents.
- 335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 209+ for magnets and subclasses 296+ for magnet structure, per se. See subclass 284 for magnetizing and demagnetizing apparatus.
- 360, Dynamic Magnetic Information Storage or Retrieval, subclasses 131+ for magnetic records claimed in terms of significant structure. Note that merely claiming the record as a wire, filament, rod, ribbon, strand or record, or no more structure than one or more coatings on a base is not significant structure under the definition of 360-131+.
- 419, Powder Metallurgy Processes, appropriate subclasses, especially subclasses 61+ for processes for making articles, which may be magnetic, from metal containing powders using pres-

- sure but no heat; and subclasses 1+ for similar process involving use of heat.
- 420, Alloys or Metallic Compositions, appropriate subclasses for a single elemental metal and for an alloy or metallic composition defined only as “magnetic”, “magnetized” or “permanent magnet” or alloys or metallic composition claimed, per se, which are inherently magnetic.
- 423, Chemistry of Inorganic Compounds, for magnetic inorganic compounds, per se.
- 427, Coating Processes, subclasses 127+ for coating processes, per se, including a magnetic base or coating.
- 428, Stock Material or Miscellaneous Articles, subclasses 544+ for stock material which is all metal or has adjacent metal components, even though claimed as being formed of magnetic material, particularly subclasses 548+ for sintered composite metal stock, subclass 611 for stock material having its magnetic properties coordinated with its shape, subclasses 681+ for a metallic composite which has an iron-base component, and subclass 928 for metallic stock distinguished by magnetic properties. See the main Class Definition of Class 428, Lines With Other Classes, “Compounds and Compositions” for the distinction between a composition and a stock material.
- 520, Synthetic Resins or Natural Rubbers, for compositions containing a synthetic resin or natural rubbers and comminuted metal. All magnetic compositions which would be classified in the Class 520 area are provided for by this subclass (62.51+).
- 523, Synthetic Resins or Natural Rubbers, subclass 181 for a composition devoid of a magnetic material but which is designed to contain same.
- 62.52** This subclass is indented under subclass 62.51. Compositions intended for use in processes of testing articles for flaws, e.g., “Magnaflux,” or for use in magnetic clutches.
- SEE OR SEARCH CLASS:
- 192, Clutches and Power-Stop Control, subclass 21.5 for clutches employing a medium having frictional characteristics which are augmented or altered in response to a magnetic field.
- 324, Electricity: Measuring and Testing, subclass 216 for methods and apparatus for magnetic flaw detection.
- 62.53** This subclass is indented under subclass 62.51. Compositions which contain a resin, wax, gum, or bitumenous material or modified forms thereof. The term gum includes, e.g., natural rubber and balatta. Many of the patents in this subclass are drawn to particles of magnetic material in a resin wax or gum binder for use as magnetic coatings or to be molded into magnetic articles (e.g., tapes).
- (1) Note. This subclass includes, e.g., cellulose ethers and esters, drying oils, shellac, varnish, gum tragacanth, and modified natural resins.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 62.51, the definition thereof, for search information relative to related coating or molding materials in other classes.
- 62.54** This subclass is indented under subclass 62.53. Compositions containing a synthetic resin or materials disclosed to be polymerizable or resinifiable to produce a synthetic resin.
- (1) Note. A synthetic resin for purposes of this subclass is a solid film forming or moldable polymeric material having physical properties akin to natural resins, the polymer chains of said synthetic resins having been prepared by the reaction of nonresinous compounds. This subclass also includes compositions containing nonresinous compounds which are recited as resinifiable to produce a synthetic resin as defined above and composition containing a catalyst to effect such resinification.
- (2) Note. Specifically excluded from this subclass are natural drying oils and the



dried compositions therefrom and cellulose or its derivatives.

**62.55** This subclass is indented under subclass 62.51. Compositions containing a free metal or an alloy thereof.

- (1) Note. Arsenic is considered to be a metal for purposes of this subclass.
- (2) Note. Intermetallic compounds are considered alloys under this subclass definition, e.g., CoPt, GdOs<sub>2</sub>.

**62.56** This subclass is indented under subclass 62.51. Compositions which contain compounds of iron and oxygen.

- (1) Note. Most of the patents in this and indented subclasses are drawn to so called "ferrites," namely complex oxides of iron and other elements. The term ferrite is used in the art both to denote definite compounds of iron with other metals and oxygen, and to generically cover compositions of fused mixed oxides of varying composition classifiable in this class.
- (2) Note. In some instances it is difficult to tell whether a fused mixture of oxides (e.g., ferrites) is a compound or a composition. If a claim of this type is restricted to atoms combined in definite, whole number ratios, the product is considered a compound. However, a patent not so limited; e.g., if the ratios of the elements are variable or "impurities" are intentionally present, is considered to be drawn to a composition classifiable in this or indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

62.55, for compositions containing both an iron-oxygen compound and a free metal.

SEE OR SEARCH CLASS:

423, Chemistry of Inorganic Compounds, for definite compounds of iron with other metals and oxygen.

**62.57** This subclass is indented under subclass 62.56. Compositions containing scandium, yttrium, gallium or an element from the rare earth or actinide series in chemically combined form.

- (1) Note. Rare earth includes an element of the Lanthanum series, atomic numbers 57-71 inclusive.
- (2) Note. Actinides includes the elements of atomic numbers 89-103.

**62.58** This subclass is indented under subclass 62.56. Compositions containing boron in any form or aluminum, thallium, or indium in chemically combined form.

**62.59** This subclass is indented under subclass 62.56. Compositions containing silicon in any form or titanium, zirconium, hafnium, germanium or indium in chemically combined form.

**62.6** This subclass is indented under subclass 62.56. Composition containing a group I metal in chemically combined form. This subclass and its indent encompasses both subgroups IA and IB and specifically includes lithium (see subclass 62.61), sodium, potassium, rubidium, cesium, francium, copper, silver and gold.

**62.61** This subclass is indented under subclass 62.6. Compositions wherein the group I metal is lithium.

**62.62** This subclass is indented under subclass 62.56. Compositions containing a group II metal or lead in combined form. Group II metal as used in this and indented subclasses encompasses subgroups IIA and IIB and specifically includes beryllium, magnesium, calcium, strontium, barium, radium, zinc, cadmium and mercury.

**62.63** This subclass is indented under subclass 62.62. Compositions containing calcium, barium, strontium or lead.

**62.64** This subclass is indented under subclass 62.62. Compositions containing magnesium.

**62.9** This subclass is indented under the class definition. Compositions specialized and designed for use as piezoelectric materials and processes of making said compositions.

- (1) Note. A piezoelectric material, for the purpose of this definition, is defined as a material which exhibits an electrostatic polarization when subjected to mechanical stress or which exhibits a mechanical stress, tending to produce a deflection when subjected to electric stress.
- (2) Note. Compositions, per se, are classified in this subclass when, by either disclosure or claim, the composition is piezoelectric.

SEE OR SEARCH THIS CLASS, SUBCLASS:

567, and 570+, for miscellaneous dielectric compositions, which should be considered as a field of search because some dielectrics, such as those used in electrets (the electrostatic analogue of the permanent magnet) which exhibit permanent polarization are believed to inherently possess piezoelectric properties.

SEE OR SEARCH CLASS:

23, Chemistry: Physical Processes, subclasses 295+ for processes of crystallizing inorganic polycrystalline chemical compounds; the products of these processes, and the seed crystals used in the processes, are classified as chemical compounds. Processes of detwinning crystals are classified in the crystallizing subclasses. Method of preventing decomposition of crystals by enclosing the crystals in an environment rich in the decomposition products so that the equilibrium tendency is against decomposition (as when an ammonium salt is surrounded with ammonia gas) are classified with the crystals. Also see subclass 273 for seed crystals combined with supports, which combination is classified as crystallizing apparatus.

- 29, Metal Working, subclass 25.35 for methods of and apparatus for manufacturing piezoelectric devices.
- 117, Single-Crystal, Oriented-Crystal, and Epitaxy Growth Processes; Non-Coating Apparatus Therefor, for processes and non-coating apparatus (including seed crystal combined with support) for growing thereindefined single-crystal of all types of materials, including inorganic or organic. The products of these processes, and the seed crystals used in the processes, are classified as chemical compounds. Processes of detwinning crystals are classified in the crystallizing subclasses. Method of preventing decomposition of crystals by enclosing the crystals in an environment rich in the decomposition products so that the equilibrium tendency is against decomposition (as when an ammonium salt is surrounded with ammonia gas) are classified with the crystals. Apparatus for detwinning crystals are classified with the crystallizing apparatus as appropriate; for example, Class 117, subclasses 200+ for non-coating apparatus which forms a therein-defined single-crystal.
- 118, Coating Apparatus, generally provides for coating apparatus, including single-crystal (e.g., epitaxy) coating means, especially subclasses 400+, 500+, or 715+.
- 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 17 for treating piezoelectric materials with an etching composition.
- 260, Chemistry of Carbon Compounds, appropriate subclasses, for processes of crystallizing organic compounds, the process being classified with its product. The products of these processes, and also the seed crystals used in the process, are classified as chemical compounds. Organic compounds, per se, are classified in Class 260, even though claimed or disclosed as being piezoelectric, when the compound is not claimed as being shaped with respect to the piezoelectric prop-

- erty and where it is uncombined with piezoelectric structure.
- 310, Electrical Generator or Motor Structure, subclasses 311+ (e.g., 357+) for piezoelectric organic or inorganic compositions of particular shape where there is a disclosure that the shape is significant to the piezoelectric property; subclass 323.11, for a piezoelectric element forming a resonant structure used in a traveling wave motor constructed of a specific substance or compound.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 129+ where a chemical reaction means is provided and subclasses 245.1+ where a physical reaction means is provided. See Class 422, subclasses 129+ or 245.1+ for crystallizing apparatus not provided for elsewhere.
- 423, Chemistry of Inorganic Compounds, for inorganic compounds, per se, even though disclosed or claimed as being piezoelectric, where the compound is not claimed as being shaped with respect to the piezoelectric property and where it is not combined with piezoelectric structure.
- 501, Compositions: Ceramic, appropriate subclasses for ceramic compositions and ceramic dielectrics, such as those containing titanate compounds, glass, porcelain, or steatite. A disclosure of or claim to piezoelectric properties results in classification in this subclass without a cross-reference to Class 501.
- 562, Organic Compounds, subclass 580 for processes of crystallizing Rochelle salt.
- 67** This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to, use in producing refrigeration, or heat or energy exchange, by operations that include vaporization, or expansion or compression, of a substance or of materials containing the same.
- (1) Note. This subclass provides, inter alia, for (1) claiming admixtures of ingredients, or claims to an old compound limited to use as a heat exchange agent, (2) processes of heat exchange comprising known heat exchange steps broadly recited and distinguished solely by the composition or compound used, and (3) apparatus with the composition or compound therein, where characteristics of apparatus structure are not claimed. The preceding are placed in this class even though freezing or boiling points or temperatures of use are specified.
- SEE OR SEARCH CLASS:  
165, Heat Exchange, subclasses 104.11+ for a heat exchange device with an intermediate fluent material receiving and discharging heat.
- 68** This subclass is indented under subclass 67. Compositions which contain agents for lubrication, inhibiting corrosion or chemical decomposition, indicating or inhibiting leakage, or an auxiliary substance for persisting as a gas, without liquefaction, solution, or absorption thereof in any significant amount.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
408, for warning agents.
- SEE OR SEARCH CLASS:  
48, Gas: Heating and Illuminating, subclass 195 for charging a combustible gas with warning agents.  
106, Compositions: Coating or Plastic, subclass 33 for leak stopping composition.
- 69** This subclass is indented under subclass 67. Compositions which contain substances of relatively low volatility as solvents or absorbents for gases or for substances of relatively high volatility.
- SEE OR SEARCH CLASS:  
502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, for solid absorbents, per se, or processes of making them.
- 70** This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to, use in preventing frost, thawing ice, maintaining temperatures within

narrow ranges, supplying or absorbing heat, or producing low temperatures, by changes in phases in substances (e.g., solidification and liquefaction) or other changes in substances other than mere temperature change, but excluding combustion and irreversible chemical reactions.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

67+, for compositions for refrigeration by vaporization or expansion, or processes of making such compositions.

**SEE OR SEARCH CLASS:**

- 44, Fuel and Related Compositions, for liquid or solid compositions for producing heat by combustion, especially subclasses 250+ for a composition which produces heat by a flameless or glowless chemical reaction which is not readily reversible.
- 48, Gas: Heating and Illuminating, for gaseous fuels.
- 106, Compositions: Coating or Plastic, subclass 13 for coating or plastic composition for preventing fog, frost or ice on a surface.
- 126, Stoves and Furnaces, subclasses 263.01+ for chemical heaters.
- 138, Pipes and Tubular Conduits, subclass 34 for pipes with means to introduce an antifreeze substance.
- 523, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly subclass 169 for a composition containing a synthetic resin or natural rubbers having utility to preserve visibility through a windshield or other optical device by preventing the buildup of fog or rendering the surface hydrophobic thereby causing the surface to repel water or to processes of preparing said composition.

- 71** This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to, use in heat exchanges or which are low-freezing or high-boiling, or which are adapted to form mixtures having a lower pour-point or freezing point when mixed with other substances.

- (1) Note. Elements other than C and H and compounds which contain such other elements are not considered to be significant in this class, when they originate in and form a part of petroleum or fractions thereof, unless such elements or compounds are recited separately in the claims.

- (2) Note. This subclass provides, inter alia, for (1) claiming admixtures of ingredients, or claims to an old compound limited to use as a heat exchange agent, (2) processes of heat exchange comprising known heat exchange steps broadly recited and distinguished solely by the composition or compound used, and (3) apparatus with the composition or compound therein, where characteristics of apparatus structure are not claimed. The preceding are placed in this class even though freezing or boiling points or temperatures of use are specified.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 67+, for fluids for use in expansible-fluid engines.
- 70, for low temperature eutectic compositions.
- 570+, for fluent dielectric Compositions ("insulating oils") which contain a hydrocarbon and a nonhydrocarbon.

**SEE OR SEARCH CLASS:**

- 122, Liquid Heaters and Vaporizers, for processes of heating liquids, etc., which may involve the use of compositions classified in this subclass (71) and its indents.
- 148, Metal Treatment, subclasses 27+ for metal treating compositions having a heat-transfer function.
- 165, Heat Exchange, subclasses 104.11+ for a heat exchange device with an intermediate fluent material receiving and discharging heat.
- 203, Distillation: Processes, Separatory, for processes of heating liquids, etc., which may involve the use of compositions classified in this subclass and its indents.

- 208, Mineral Oils: Processes and Products, for processes of heating liquids, etc., which may involve the use of compositions classified in this subclass and its indents.
- 508, Solid Antifriction Devices, Materials Therefor, Lubricant and Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, for compositions similar to those of this subclass when such compositions are specialized for use as lubricants.
- 72** This subclass is indented under subclass 71. Compositions which contain agents for stopping or reducing leaks in containers.
- SEE OR SEARCH CLASS:
- 106, Compositions: Coating or Plastic, subclass 33 for leak stopping compositions, per se.
- 73** This subclass is indented under subclass 71. Compositions which contain organic compounds.
- 74** This subclass is indented under subclass 73. Compositions which contain metals, compounds thereof, inorganic compounds, or elements, other than water.
- 75** This subclass is indented under subclass 74. Compositions which contain organic compounds which contain nonmetallic elements other than carbon, hydrogen and oxygen.
- 76** This subclass is indented under subclass 74. Compositions which contain organic compounds which contain a carboxyl radical (--COO--).
- 77** This subclass is indented under subclass 73. Compositions which contain organic compounds which contain nonmetallic elements other than carbon, hydrogen and oxygen.
- 78.1** This subclass is indented under subclass 77. Compositions containing organic compounds which have nonmetallic elements other than carbon, hydrogen, oxygen and nitrogen.
- 78.3** This subclass is indented under subclass 78.1. Compositions in which the organic compounds contain silicon.
- 78.5** This subclass is indented under subclass 78.1. Compositions in which the organic compounds contain phosphorus.
- 79** This subclass is indented under subclass 73. Compositions which contain organic compounds which contain a carboxyl radical (--COO--).
- 79.1** Compositions specialized and designed for the treatment of mineral substances (including metal) by surface removal with chemical agents.
- (1) Note. This and indented subclasses also provide for patents which in addition to a composition claim also contain a claim to a nominal process of treating material therewith (e.g., etching, contacting, etc.) even though the composition of the material treated is recited.
- (2) Note. Compositions for "bright polishing" involving the production of a shiny, mirror-like or specular finish on metals are considered to involve surface removal for this and indented subclasses.
- SEE OR SEARCH CLASS:
- 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, for compositions used in dyeing fabrics for the chemical modification of the fiber or fabric to produce ornamental effects.
- 134, Cleaning and Liquid Contact With Solids, subclass 2, 27, 28, 41, and 42 for processes for cleaning or pickling metals using an acid or alkali.
- 148, Metal Treatment, subclasses 6+ for forming of a coating on a metal surface by chemical reaction.
- 166, Wells, subclass 307 and the subclasses there noted for well treating methods which include materials which etch the formation.

- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclasses 210+, 221, and 223 for etching processes combined with electrolytic coating and subclasses 640+ and 687+ for electrolytic etching processes without formation of an electrolytic coating.
- 216, Etching a Substrate: Processes, for etching processes. Any detail of a treating step, e.g., dipping, spraying, etc., is sufficient to render an etching process more than nominal, and to place the patent in Class 216.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, for compositions used to clean a solid surface by removal of foreign matter and not involving the removal of the surface, per se, especially subclasses 245+ for bare metal surface cleaning compositions.
- 79.2** This subclass is indented under subclass 79.1. Compositions containing an inorganic acid.
- 79.3** This subclass is indented under subclass 79.2. Compositions which contain a fluorine compound.
- (1) Note. The fluorine compound may be the acid or a different compound in addition to the acid.
- 79.4** This subclass is indented under subclass 79.2. Compositions which contain an organic material in addition to the acid.
- 79.5** This subclass is indented under subclass 79.1. Compositions which contain an alkali metal hydroxide.
- (1) Note. The hydroxide may be the etching or brightening compound or may be used in addition thereto.
- 88.1 DUST SUPPRESSANTS FOR BULK MATERIALS, OR PROCESSES OF PREPARING (E.G., FOR CONSOLIDATING**

**DUST IN COAL MINES, CONTROLLING SOIL EROSION, ETC.):**

This subclass is indented under the class definition. Compositions specialized or designed for suppressing dust (e.g., by binding, consolidating, etc.) from materials stored in large bulk, usually in open outdoor spaces, or processes of preparing the compositions.

- (1) Note. Processes involving the mere use of a claimed composition are included in this subclass. If no composition is claimed or significant process steps are involved in addition to such mere use, the patent is classifiable in other appropriate classes.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 88.2, for compositions intended to be applied to a substrate for collecting fine particles.

**SEE OR SEARCH CLASS:**

- 299, Mining or In Situ Disintegration of Hard Material, subclass 12 for processes of assuring mine safety.
- 404, Road Structure, Process, or Apparatus, subclass 76 for processes of dust fixation or soil stabilization.

**88.2 COMPOSITIONS FOR COATING OR IMPREGNATING A SUBSTRATE USED FOR COLLECTING FINE PARTICLES BY ADHERENCE, OR PROCESSES OF PREPARING (E.G., FOR IMPREGNATING DUSTING CLOTHS, DUST FILTERS, ETC.):**

This subclass is indented under the class definition. Compositions specialized or designed for collection of fine particles, such as dust, by adherence to a substrate coated or impregnated with the composition, such as furnace filters, or processes of preparing the compositions.

- (1) Note. Processes involving the mere use of a claimed composition are included in this subclass. If no composition is claimed or significant process steps are involved in addition to such mere use, the patent is classifiable in other appropriate classes.

## SEE OR SEARCH CLASS:

- 15, Brushing, Scrubbing, and General Cleaning, for dust cloths.
- 95, Gas Separation: Processes, particularly subclasses 273+ for processes of separating solid particles from gas which may include use of a particle adherent composition.
- 149, Explosive and Thermic Compositions or Charges, subclass 108.4 for waste containing explosives and methods of removing their residues.

- 175** This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to, use in treating water to soften or purify it, to precipitate impurities in it, or to inhibit formation of scale or incrustation in steam boilers or other water containers, or processes of making such compositions.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

- 387+, for corrosion inhibiting agents.

## SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclasses 660+ for processes of separation involving ion exchange or sorption, and subclasses 702+ for separating processes involving precipitation.
- 423, Chemistry of Inorganic Compounds, subclasses 324+ for inorganic silicates.
- 424, Drug, Bio-Affecting and Body Treating Compositions, appropriate subclass for a biocidal composition which is intended to sterilize water.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, subclasses 247+ for water scale removing compositions.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 113+ for compositions for or subcombination compositions for or breaking of or inhibiting of colloid systems (e.g., foam breaking, emulsion breaking, dispersion inhibiting, suspension set-

ting, gel breaking, smoke suppressing, coagulating, flocculating), when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

- 176** This subclass is indented under subclass 175. Compositions in the form of packages or which contain, in each case, a particular heterogeneous arrangement of two or more components, other than mixed granules, which differ from each other chemically or physically.

- 178** This subclass is indented under subclass 175. Compositions which contain deoxidants or free metals.

## SEE OR SEARCH CLASS:

- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, subclass 248 for descaling agents including a free element component (e.g., metal).

- 179** This subclass is indented under subclass 175. Compositions which contain substantially water-insoluble materials which are adapted to bind or take up bases or cations in exchange for other bases or cations.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

- 193, for compositions for chemically binding ammonia, alkali or other bases.

## SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclasses 660+ for processes of separation involving ion exchange or sorption.
- 423, Chemistry of Inorganic Compounds, subclasses 700+ for zeolites and appropriate subclasses for aluminosilicate compounds having base-exchange capabilities.

- 180** This subclass is indented under subclass 175. Compositions which contain plants, plant parts or extracts, or organic compounds.

**181** This subclass is indented under subclass 180. Compositions which contain inorganic compounds or elements other than alkali metal hydroxides, alkali metal carbonates and water.

**181.1** This subclass is indented under the class definition. Compositions which are (1) designed for use as a getter for an electric lamp, an electric space discharge device, or other container which is either evacuated or contains a confined atmosphere of gas or vapor, and (2) designed for use in generating a gas or vapor within the container of an electric lamp, and electric space discharge device or similar container.

(1) Note. Getters are materials which, when used in closed containers, reduce the gas or vapor content of the container. A getter may react with the gas or vapor in the container to form a solid nonvaporizable material, or to adsorb or absorb the gas or vapor, or may reduce the amount of the gas or vapor in the container in any other way. The material may be a getter for one gas or vapor and may not have any effect upon another gas or vapor.

(2) Note. These subclasses provide for all materials which are limited by the claims to use as a getter. Where the patent claims a material broadly as well as claiming a getter made of the material, the patent will be classified with the appropriate material where the material is classified in a class other than Class 252 and cross-referenced here. These subclasses provide for all materials broadly or specifically claimed which are not otherwise classified which are disclosed for use as getters.

(3) Note. These subclasses provide for patents which claim merely a container or device which contains a particular getter material where no structure of the container or device is set forth. Where the device is claimed by name only, as an electric lamp, or where details of the device are claimed, the patent is classified with the device.

(4) Note. Where the patent claims a process of gettering and also contains claims to the gettering material, the patent is classified with the art which provides for the process and is cross-referenced to these subclasses.

#### SEE OR SEARCH THIS CLASS, SUBCLASS:

- 4+, for compositions for use in extinguishing fires which contain components for generating gas by chemical reactions.
- 182+, for compositions for use as agents or materials for absorbing or binding extraneous compounds or elements, or for use in causing or carrying out other changes by chemical reactions.
- 194, for compositions for use in absorbing, binding, removing or retaining water.
- 364, for compositions for use as solvents, including such compositions as are solvents for gases.
- 372+, for compositions which are gaseous, and the processes of making them.
- 500+, for materials for filaments, electrodes and shields for electric lamps and electric space discharge devices. Such a material when also adapted to act as getter or a gas or vapor generating material is classified in subclasses 181.1+, and cross-referenced into subclasses 500+.

#### SEE OR SEARCH CLASS:

- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 228+ for a composition having a continuous phase of free metal made by consolidating metal particles, and subclasses 255+ for a loose metal particle composition.
- 95, Gas Separation: Processes, for processes involving steps resulting in separation of a gas from a fluid mixture comprising (a) a gas and solid or liquid particles entrained therein, (b) a liquid and gas entrained therein, or (c) a plurality of gases. See particularly subclasses 90+ for processes of gas separation using a solid sorbent.



- 96, Gas Separation: Apparatus, for apparatus used in separation of a gas from a fluid mixture comprising (a) a gas and solid or liquid particles entrained therein, (b) a liquid and gas entrained therein, or (c) a plurality of gases. See particularly subclasses 108+ for solid sorbent apparatus for gas separation.
- 313, Electric Lamp and Discharge Devices, subclasses 545, 546, and 547+ for electric lamps and electric space discharge devices which are provided with a getter or gas or vapor generating material within the envelope of the device.
- 417, Pumps, subclasses 48+ for electrical or getter type devices, which are more than merely the material, including significant claimed containers holding getter material for disposition in a chamber to be evacuated.
- 423, Chemistry of Inorganic Compounds, subclasses 210+ for purifying or separating gaseous components by a chemical reaction.
- 428, Stock Material or Miscellaneous Articles, subclasses 546+ for metallic stock comprising metal particles.
- 445, Electric Lamp or Space Discharge Component or Device Manufacturing, particularly subclass 41 for gettering processes.
- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, for a composition comprising a catalyst or support therefor or sorbent of general utility.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, for cleaning compositions of general or specific utility, particularly subclasses 367+ for those compositions which are adapted to bleach or oxidize by chemical reaction.
- 181.2** This subclass is indented under subclass 181.1. Materials which contain either (1) a plurality of getter substances, (2) a plurality of materials capable of generating two or more different gases or vapors, or (3) a material capable of generating a gas or vapor and a different material capable of acting as a getter.
- (2) Note. As many getter and gas or vapor generating materials contain two or more ingredients, classification in this subclass depends principally upon the disclosure of the patent.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
181.1+, for the case where there is only a single gas or vapor generated and such gas or vapor is capable of acting as a getter as well as being capable of supplying a gas or vapor.
- 181.3** This subclass is indented under subclass 181.1. Materials which contain a plurality of substances not in chemical combination with each other, at least two of the substances being capable of chemically reacting with each other to produce the getter or gas or vapor generating material.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
182+, for compositions for use as agents or materials in causing or carrying out changes by chemical reactions.
- 181.4** This subclass is indented under subclass 181.3. Materials which contain magnesium, an alkali metal or an alkaline earth metal, or a compound thereof.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
181.7, for other materials under subclass 181.1 which contain magnesium, an alkali metal, an alkaline earth metal or a compound thereof.
- 181.5** This subclass is indented under subclass 181.1. Getters where the getter material is normally gaseous.
- (1) Note. This subclass does not include materials which are rendered gaseous or vaporous by treating a substance which is normally nongaseous or vaporous.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
372+, for gaseous compositions.

**181.6** This subclass is indented under subclass 181.1. Materials which contain a metal or metal compound.

SEE OR SEARCH THIS CLASS, SUBCLASS:

181.1, see (2) Note, for the line between this subclass and the classes which provide for metals, alloys, and metal compounds.

SEE OR SEARCH CLASS:

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, appropriate subclasses for processes of making metals, and subclasses 228+ for consolidated and 255+ for loose metal particle compositions.

420, Alloys or Metallic Compositions, appropriate subclasses for alloys or metallic compositions, per se.

423, Chemistry of Inorganic Compounds, appropriate subclasses for metal containing inorganic compounds, per se.

556, Organic Compounds, appropriate subclasses for carbon compounds which contain a metal, see subclasses 1+ where the compound contains a heavy metal and subclasses 170+ where the compound contains aluminum.

**181.7** This subclass is indented under subclass 181.6. Materials which contain magnesium, an alkali metal, an alkaline earth metal, or a compound thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

181.4, for this subject material where the getter or gas or vapor material is generated from a reactive composition.

SEE OR SEARCH CLASS:

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 255+ for loose mixtures of metal or alloy powder.

420, Alloys or Metallic Compositions, appropriate subclasses for a single alloy or metallic composition in the form of a powder.

**182.1** This subclass is indented under the class definition. Compositions which are chemically reactive and have utility in electro-chemical cell, e.g., battery, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

425.3, for process of making a catalytic electrode.

SEE OR SEARCH CLASS:

429, Chemistry: Electrical Current Producing Apparatus, Product and Process, appropriate subclasses for materials of this subclass combined with battery structure, e.g., electrolyte, electrode, etc.

**182.11 COMPOSITIONS CONTAINING A SINGLE CHEMICAL REACTANT OR PLURAL NONINTERACTIVE CHEMICAL REACTANTS; I.E., NOT VIS-A-VIS:**

This subclass is indented under the class definition. Compositions containing a single reactant or plural reactants under the class definition specialized or designed for use in subsequent reactions with other materials, but not with each other.

(1) Note. The addition of a material which serves a dual purpose, i.e., reactant plus diluent, solvent, plasticizer, etc., will be classified as a reactant; if the patent is silent as to its function than it will be classified as a nonreactive material.

(2) Note. The relationship between a subclass and subclasses indented thereunder is such that reference is always to the same reactant, unless the indented subclass begins with "With or Contains" in which case they may refer to any reactant.

(3) Note. A composition containing a reactant metal, element or compound stabilized with a specified material, or a process of making such a composition, is nonetheless classified accordingly

with the metal, element or compound classes.

- (4) Note. Whenever possible, full recognition should be given to the term "catalyst" in describing a given substance even though from prior art the substance is known to behave as a reactant. Thus, triethanolamine can react with polyisocyanates to form polyurethanes; however, if it stated that triethanolamine functions as a catalyst in aiding the condensation of polyols with polyisocyanate, then it is classified in the catalyst class and not as a reactant. Similarly, a composition specified to function as an accelerating agent will be classified in the catalyst class. Vulcanizing a curing compositions are considered proper herein unless it is clear that their function is strictly catalytic. Peroxide compositions, per se, will be considered as catalysts, and therefore, proper for the catalyst class.

- (5) Note. To be classified in this or the indented subclasses a patent must not recite a claim drawn to a composition containing a solid synthetic polymer. Where a patent sets forth claims which are drawn to species that may or may not be synthetic polymers as per disclosure, or where a patent contains only generic claims and the disclosure, or where a patent contains only generic claims and the disclosure sets forth species which are appropriate as synthetic polymers and species which are appropriate as synthetic polymers and species which are not, the patent is placed here as an original with the species which are appropriate as synthetic polymers and species which are nonresinous and cross-referenced to the appropriate polymer classes. Polymers are limited to synthetic organic polymers and excludes inorganic polymer, natural polymers, e.g., starch, cellulose, collagen, wool, etc.

- (6) Note. A composition which contains (1) potentially reactable ingredients to be polymerized and (2) all or the necessary reactants to form a desired synthetic

resin or (3) those reactants which are potentially reactable at room temperature or that require merely heat and/or pressure or moisture when reactant contains Si-C, Si-H, -N=C=X, (X is chalcogen) or is a liquid polysulfide is classified in appropriate polymer classes.

- (7) Note. See Lines With Other Classes and Within This Class, in the main class definition of this class (252) for a hierarchical listing of composition classes.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 2+, for gas generating compositions for extinguishing fires.  
60+, for gas generating compositions specialized for use in forthfloatation separation processes.  
181.1+, for getter and gas or vapor generating compositions for electric lamps, electric space discharge devices and other evacuated or gas or vapor filled containers.  
183.11, for the addition of a stabilizer or inhibitor to a composition to prevent the interaction between two or more reactants, such that the reactants can interact on removal of the stablizer or inhibitor.

SEE OR SEARCH CLASS:

- 149, Explosive and Thermic Compositions or Charges, appropriate subclasses for gas generating compositions which undergo a chemical change at a very rapid rate, or rate approaching instantaneous reaction, resulting in the production of usable force as in blasting, fire arms, jet propulsion, filling automotive passenger gas-bags, etc.  
502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, for catalysts and reaction accelerating agents, per se.  
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents

(such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (182.11) and its indented subclasses.

- 521, Synthetic Resins or Natural Rubbers, subclasses 50+ for compositions containing all the required reactants or polymer derived thereof plus a foam generating composition (blowing agent).

#### **182.12 Organic reactant:**

This subclass is indented under subclass 182.11. Subject matter wherein the composition contains a single reactant or plural noninteractive chemical reactants at least one of which is organic in nature.

- (1) Note. The term organic denotes the reactant as one which has carbon therein the which is further characterized by the presence of (a) a C-C bond, or (b) C-H bond, or (c) (C-halogen bond, or (d) C-N or C=N bond, with the proviso that hydrocyanic acid, cyanogen, isocyanic acid, cyanamide, cyanogen halide, isothiocyanic acid, and metal carbides are excluded as being organic in nature.

#### **182.13 For subsequent solid polymer treatment or preparation; e.g., crosslinking, grafting, curing, hardening, vulcanizing, etc.:**

This subclass is indented under subclass 182.12. Subject matter designed for subsequent use in polymerization processes and other polymer treating processes, e.g.,

crosslinking, grafting, blocking, curing, hardening, vulcanizing, etc.

- (1) Note. The term "subsequent" means that the claimed composition will be used in one of the above stated processes directly, immediately or in the very near future, and not remotely. Thus, for example, a composition which contains a glycol which is to be subsequently transformed into a liquid polyester is not classified in this subclass. The subsequent esterification will not lead to a solid polymer but merely the preparation of a compound by definition. So, too, a composition designed for subsequent preparation of cyclic trimers for tetramers, etc, which, by disclosure are compounds, are also excluded from this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

182.12, for a composition containing a glycol which is to be subsequently transformed into a liquid polyester.

#### **182.14 Reactant contains element other than C, H, O, or N:**

This subclass is indented under subclass 182.13. Subject matter wherein a reactant contains an element other than C, H, O, or N, e.g., an isocyanate compound containing silicon, or a phosphorous-containing polyol both used for preparing polyurethanes, etc.

#### **182.15 Halogen:**

This subclass is indented under subclass 182.14. Subject matter wherein the organic halogen compound contains bromine or iodine.

#### **182.16 Bromine or iodine:**

This subclass is indented under subclass 182.15. Subject matter wherein the organic halogen compound contains bromine or iodine.

#### **182.17 Sulfur:**

This subclass is indented under subclass 182.14. Subject matter wherein the organic compound contains sulfur.

**182.18 Reactant contains ethylenic group:**

This subclass is indented under subclass 182.13. Subject matter wherein the reactant contains an ethylenic group, e.g., methyl methacrylate, acrylic acid, etc.

**182.19 Cyclic anhydride moiety:**

This subclass is indented under subclass 182.18. Subject matter wherein the organic reactant containing an ethylenic groups also contains an anhydride moiety, e.g., maleic anhydride, etc.

**182.2 Reactant contains isocyanate ( $-N=C=O$ ) or blocked isocyanate group:**

This subclass is indented under subclass 182.13. Subject matter wherein the organic reactant contains an isocyanate ( $-N=C=O$ ) or blocked isocyanate ( $-NHC(=O)-OR$ ) group.

- (1) Note. A blocked isocyanate is an isocyanate which has been rendered inert by conversion to an inactive group usually in the form of a urethane ( $-N-C(=O)-OR$ ) group.

**182.21 Two or more reactants containing isocyanate or blocked isocyanate groups:**

This subclass is indented under subclass 182.2. Subject matter wherein the composition contains two or more reactants which contain isocyanate or blocked isocyanate groups; e.g., an isomeric mixture of 2, 2'-, 2, 4'- and/or 4, 4'-diisocyanate diphenylmethane, etc.

**182.22 Urethane ( $-N-C(=O)-O-C-$ ) group:**

This subclass is indented under subclass 182.21. Subject matter wherein the isocyanate compound in addition contains either a blocked isocyanate or urethane group.

- (1) Note. Found here typically is a polyisocyanate treated with a polyol yielding an isocyanate terminated polyurethane.

**182.23 Reactant contains oxygen:**

This subclass is indented under subclass 182.13. Subject matter wherein the organic reactant contains oxygen.

**182.24 Reactant contains plural hydroxyl groups:**

This subclass is indented under subclass 182.23. Subject matter wherein the organic reactant contains plural hydroxyl groups, e.g., ethylene glycol, glycerine, sucrose, starch, etc.

**182.25 Three or more reactants containing plural hydroxyl groups:**

This subclass is indented under subclass 182.23. Subject matter where three or more organic reactants contain plural hydroxyl groups.

**182.26 Reactant contains nitrogen:**

This subclass is indented under subclass 182.24. Subject matter wherein the organic reactant contains nitrogen, e.g., triethanolamine, etc.

**182.27 Reactant contains ether linkage:**

This subclass is indented under subclass 182.14. Subject matter wherein the organic reactant additionally contains an ether linkage, e.g., polyethylene glycol, etc.

**182.28 Reactant contains carboxylic acid group or derivative thereof:**

This subclass is indented under subclass 182.23. Subject matter wherein the oxygen containing organic reactant is a carboxylic acid or derivative thereof.

- (1) Note. A carboxylic acid derivative denotes: nitrile, ester, anhydride, salt, amide, imide, lactam, lactone, and acyl halide. The metal salt and acyl halide are not classified herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

182.14, for the metal salt and acyl halide.

**182.29 With stabilizer or inhibitor:**

This subclass is indented under subclass 182.12. Subject matter wherein the composition contains material whose sole function is to impart stability to one or more compounds for the purpose of delaying or retarding a chemical change in one or more of these compounds, until such time when one or more of these compounds may under so a subsequent reaction.

- (1) Note. This stabilization or inhibition process may occur in any number of ways too numerous, if not impossible to elaborate here. However, some processes may be: coating, encapsulation, impregnation, complexation, or other altered chemicals forms, e.g., salting, hydrogen, bonding, tautomerizing, clathration, etc. It is imperative to point out that the stabilization or inhibition is related to only a chemical change and not to any physical change. Thus, a surfactant added to a composition to form a stable emulsion of a given reactant is not classified in this subclass, whereas the stabilization of a solution of a reactant wherein said reactant is unstable in the presence of the solvent is properly classified here, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 380+, for stabilizing or inhibiting compositions.
- 186.24, for the addition of (1) a metal salt to stabilize  $H_2O_2$  against decomposition and (2) a third substance e.g. a dye to indicate possible peroxide decomposition by way of a color change.

SEE OR SEARCH CLASS:

- 260, Chemistry of Carbon Compounds, main class definitions, fourth full paragraph for a similar discussion as related to organic compounds.
- 423, Chemistry of Inorganic Compounds, subclass 265 for a detailed discussion on the use of additives to an inorganic compound wherein the resultant composition is properly classified herein. For example, the addition of a metal salt to stabilize hydrogen peroxide against decomposition would be classified in Class 423, subclass 273.

**182.3 Reactant contains phosphorous, silicon, or sulfur atom, or contains metal-to-carbon bond:**

This subclass is indented under subclass 182.11. Subject matter wherein the organic reactant contains a phosphorous, silicon or sulfur atom or contains a metal-to carbon bond,

e.g., mixture of phosphite compounds to scavenge aldehydes and ketones, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 2+, for gas generating compositions for extinguishing fires.
- 60+, for generating compositions specialized for use in frothfloatation separation processes.
- 181.1, for getter and gas or vapor generating composition for electric lamps, electric space discharge devices and other evacuated or gas or vapor filled containers.

SEE OR SEARCH CLASS:

- 149, Explosive and Thermic Compositions or Changes, appropriate subclasses for gas generating composition which under go a chemical change at a very rapid rate, or a rate approaching instantaneous reaction, resulting in the production of usable force as in blasting, fire arms, jet propulsion, filling automotive passenger restraining gas-bags, etc.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition

would otherwise be proper for this subclass (182.11) and its indented subclasses.

- 521, Synthetic Resins or Natural Rubbers, subclasses 50+ for compositions containing all the required reactant or polymer derived thereof plus foam generating composition (blowing agent).

**182.31 Reactant contains phenolic, phenolic ether, or inorganic phenolate group:**

This subclass is indented under subclass 182.12. Subject matter wherein the organic reactant is a phenolic, phenolic ether or inorganic phenolate compound, e.g., phenol, bisphenol A, the diglycidyl ether or bisphenol A, sodium pentachlorophenolate, etc.

**SEE OR SEARCH CLASS:**

- 520, Synthetic Resins or Natural Rubbers, the Class Definition glossary for a detailed definition of a phenol, phenol ether and inorganic phenolate; this is encompassed under the heading "phenolic reactant."

**182.32 Inorganic reactant other than sulfur containing:**

This subclass is indented under subclass 182.11. Subject matter wherein the composition contains an inorganic reactant other than sulfur, e.g., a solution of silicon tetrafluoride in tetrahydrofuran, liquid hydrogen fluoride dimethyl sulfoxide, etc.

**182.33 Reactant contains heavy metal:**

This subclass is indented under subclass 182.32. Subject matter wherein the inorganic reactant contains a heavy metal, e.g., titanium, vanadium, iron, manganese, etc.

**182.34 Reactant contains nitrogen:**

This subclass is indented under subclass 182.32. Subject matter wherein the inorganic reactant contains nitrogen, e.g., ammonium hydroxide sodium nitrate, etc.

**182.35 Reactant contains aluminum or phosphorous:**

This subclass is indented under subclass 182.32. Subject matter wherein the inorganic reactant contains aluminum or phosphorus,

e.g., phosphoric acid, aluminum hydroxide, etc.

**183.11 CHEMICALLY INTERACTIVE REACTANTS (VIS-A-VIS):**

This subclass is indented under the class definition. Compositions which contains a mixture or association of two or more reactants chosen for subsequent and not immediate chemical interaction thereof, i.e., vis-a-vis, substances peculiar thereto, and processes of making the same.

- (1) Note. This subclass provides for the addition of a stabilizer or inhibitor to a composition to prevent the interaction between two or more reactants such that the reactants can interact subsequently upon removal or interruption of the stabilizer or inhibitor or otherwise render them reactive.
- (2) Note. This subclass does not take solid synthetic polymers as part of a composition.
- (3) Note. A composition containing potentially reactable ingredients which are to be polymerized and which contains all of the necessary reactants to form the desired solid synthetic resin; or contains those reactants which are potentially reactable at room temperature or requiring merely the addition of heat, pressure, or moisture when said reactants contain a Si-C, Si-H bond or -N=C=X group (wherein x is a chalcogen atom); or contains a liquid polysulfide is classified in appropriate polymer classes.

**SEE OR SEARCH CLASS:**

- 428, Stock Material or Miscellaneous Articles, subclasses 402+, for solid polymer reactants A and B microencapsulated within a given microcapsule or a sphere or specified dimensions, and wherein the two are stabilized for subsequent reaction.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dis-

persions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (183.11) and its indented subclasses.

520, Synthetic Resins or Natural Rubbers, appropriate subclasses for a composition containing a solid polymer admixed with a reactant, which may be an additional solid polymer.

**183.12 With stabilizer or inhibitor:**

This subclass is indented under subclass 183.11. Subject matter wherein the composition contains a material whose sole function is to impart stability or inhabitation to one or more components in order to delay or retard a chemical reaction from occurring.

SEE OR SEARCH THIS CLASS, SUBCLASS:

182.29, for a more detailed discussion or this subject matter.

**183.13 Organic reactant admixed with inorganic reactant:**

This subclass is indented under subclass 183.11. Subject matter wherein composition contains both an organic reactant and an inorganic reactant, e.g., tartaric acid and sodium bicarbonate, desiccated alkali metal formate and dehydrated aluminum sulphate, etc.

**183.14 Inorganic reactants only:**

This subclass is indented under subclass 183.11. Subject matter wherein the composition contains only inorganic reactants, e.g., a heat producing composition containing magnesium sulfate and iron oxide, etc.

**183.15 Calcium carbide precursors:**

This subclass is indented under subclass 183.14. Subject matter wherein the inorganic reactants are considered calcium carbide precursors, i.e., which when reacted, will produce calcium carbide, e.g., calcium oxide and coke, etc.

**183.16 Contains carbonate or bicarbonate:**

Subject matter under search class 183.14 wherein the composition contains an inorganic carbonate or bicarbonate, e.g., a buffering composition containing a mixture of aluminum hydroxide and ammonium bicarbonate, etc.

**184 (E.G, EXPLOSIVE DOOR HINGE, TOOL EXPLOSIVELY ACTUATED, BAND RELEASE, EXPANSION OF TUBE, CABLE CUTTER, EXPLOSIVELY OPERATED SPLITTING WEDGES)**

This subclass is indented under subclass 182. Compositions in each case specialized and designed for, or peculiar to, use in both absorbing or binding an extraneous substance, physically or chemically, and yielding by chemical reaction a chemically-free third substance which does not contain the substance which is absorbed or bound, or in making substances for such use; such as ion exchange compositions.

SEE OR SEARCH CLASS:

521, Synthetic Resins or Natural Rubbers, subclasses 25 through 39 for synthetic ion exchange resins.

**185** This subclass is indented under the class definition. Compositions which contain substances which contain lead or a lead compound for, or peculiar to, use in treating petroleum to "sweeten" it, or eliminate therefrom or modify sulfur or sulfur compounds therein, or chemically binding extraneous sulfur or chemically modifying extraneous sulfur compounds, or in making substances for such use.



## SEE OR SEARCH CLASS:

208, Mineral Oils: Processes and Products, subclasses 197+ for processes of sweetening mineral oils using lead compounds.

**186.1 OXIDATIVE BLEACHANT, OXIDANT CONTAINING, OR GENERATIVE:**

This subclass is indented under the class definition. Compositions which contain substances for, or peculiar to, use in bleaching by oxidation, or in other oxidation of extraneous substances, or in generating oxygen, or in making substances for such use, or processes of making such compositions or mere method of using such compositions.

- (1) Note. A material qualifies as an oxidizing agent either if it is so claimed, disclosed, or if it is generally art recognized as such.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

184, for such compositions which are also chemically yielding.  
372+, for gaseous compositions containing an oxidant.

## SEE OR SEARCH CLASS:

- 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 101+ for processes of bleaching or decoloring textiles and which are other than the mere application of a novel oxidizing bleach composition.  
149, Explosive and Thermic Compositions or Charges, subclass 1 and 119 for a collection of organic and inorganic compounds having oxidative uses in compositions of that class.  
210, Liquid Purification or Separation, subclasses 749+ for processes of chemically treating a liquid for the purpose of purifying the liquid using an oxidizing composition, e.g., a method to reduce the bacteria count in water using sodium hypochlorite would be classified in Classes 210, subclass 756.

- 260, Chemistry of Carbon Compounds, appropriate subclasses for organic compounds, per se, which may be oxidative and admixture of such compounds with agents designed to improve the stability of such compounds.  
423, Chemistry of Inorganic Compounds, subclasses 265+ for an inorganic compound, which may be oxidative, admixed with an agent designed to improve the stability of such a compound.  
424, Drug, Bio-Affecting and Body Treating Compositions, subclass 62 for compositions under the class definition which bleach or remove color from live skin or hair and which are applied topically.  
502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, for compositions containing an oxidant claimed or solely disclosed as a catalyst.  
510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, especially subclasses 302+ and 367+ for cleaning compositions including an oxidant or chemical bleach component.  
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, subclasses 31+ for colloid systems of colloid-sized solid or semisolid phase dispersed in primarily organic continuous liquid phase, subclasses 77+ for colloid systems of colloid-sized solid phase dispersed in aqueous continuous liquid phase; or agents for such systems or making or stabilizing such systems or agents; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.  
520, Synthetic Resins or Natural Rubbers, appropriate subclasses for treating a resin with an oxidizing agent or generative.

**186.2 Composition containing two or more solid materials with defined physical dimensions; e.g., surface areas, volumes, etc., or process of producing said composition:**

This subclass is indented under subclass 186.1. Compositions wherein two or more solid materials possess defined physical dimensions or surface areas.

- (1) Note. The solid materials may be reactants, polymeric or nonpolymeric or non-reactant materials.

**186.21 Plural oxidants:**

This subclass is indented under subclass 186.1. Compositions which contains two or more oxidizing agents, e.g., a liquified mixture of chlorine and chlorine dioxide, sodium chlorate and sodium peroxide, etc.

**186.22 Contains plural peroxides:**

This subclass is indented under subclass 186.21. Compositions wherein at least two of the oxidants are peroxides, e.g., ammonium persulfate and sodium peroxide, etc.

**186.23 Organic peroxide:**

This subclass is indented under subclass 186.22. Compositions wherein at least one of the peroxides is organic, e.g., peracetic acid, ditertiary butyl peroxide, etc.

**186.24 Contains elemental material devoid of water:**

This subclass is indented under subclass 186.1. Compositions which contains an elemental material and which composition is further devoid of water, e.g., graphite, charcoal, metal alloys, oxygen, ozone, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

186.33, 186.36 and 187.1+, for compositions containing elemental material in admixture with water.

372+, for gaseous compositions containing elemental gases, e.g., hydrogen and carbon monoxide, hydrogen and nitrogen, etc.

**186.25 Composition containing a stabilizer or a product in the form of a surface-modified, impregnated, encapsulated, or surface-**

**coated article; or process of producing said composition:**

This subclass is indented under subclass 186.1. Compositions containing a stabilizer wherein the stabilizer is accompanied by additional materials properly classifying the composition herein, e.g., a composition comprised of an oxidant, stabilizer, plasticizer and densifying agent, etc.; a composition containing a product therein which is a surface coated, impregnated, encapsulated, or surface modified material, e.g., fiber, sheet, particle, or web, etc.

- (1) Note. This subclass does not require that the product admixed be in the same physical or chemical state after achieving the final composition, e.g., the composition or product, per se, may be comminuted, chemically treated, transitory, etc.

SEE OR SEARCH CLASS:

149, Explosive and Thermic Compositions or Charges, subclass 3 for a coated component.

423, Chemistry of Inorganic Compounds, for a Class 423 product admixed with a stabilizer and the admixture is neither disclosed nor claimed as having any utility.

428, Stock Material or Miscellaneous Articles, subclasses 221+ for web or sheet containing structurally defined element or component; and subclasses 357+ for coated or structurally defined flake, particle, cell, strand, strand-portion, rod, filament, macroscopic fiber, or mass thereof.

520, Synthetic Resin or Natural Rubbers, appropriate subclasses for a material impregnated, encapsulated, surface modified or surface coated in a solid polymer.

**186.26 Organic peroxide:**

This subclass is indented under subclass 186.25. Compositions which contains an organic peroxide, e.g., a composition containing sodium peroxy carbonate coated with a stabilizing quantity of fatty alkanol-amides, etc.

**186.27 Inorganic peroxide:**

This subclass is indented under subclass 186.25. Compositions which contains an inorganic peroxide, e.g., a stabilized composition containing sodium peroxide, magnesium acetate, and alkali metal silicate, etc.

**186.28 Contains hydrogen peroxide:**

This subclass is indented under subclass 186.27. Compositions wherein the inorganic peroxide is hydrogen peroxide, e.g., a composition comprised of hydrogen peroxide stabilized with sodium stannate and aluminum acetate, etc.

**186.29 With organic material:**

This subclass is indented under subclass 186.28. Composition which contains an organic material, e.g., a composition comprised of hydrogen peroxide admixed with a stabilizing amount of 1-hydroxy ethylidene-1, 1-diphosphonic acid, etc.

- (1) Note. The presence of the organic material need not be attributed exclusively to either a stabilizing agent or a material used to coat, impregnate, encapsulate, or surface modify a particle, but may function in other capacities, e.g., filler, plasticizer, solvent, etc.

**186.3 Contains perborate:**

This subclass is indented under subclass 186.27. Compositions which contains inorganic perborate salts, e.g., a composition comprised of sodium perborate stabilized with particle coating of sodium carbonate, etc.

**186.31 With organic material:**

This subclass is indented under subclass 186.3. Composition which contains an organic material, e.g., a bleaching composition comprised of sodium perborate and benzoic anhydride coated onto expanded perlite particles, etc.

- (1) Note. The presence of the organic material need not be attributed exclusively to either a stabilizing agent or a material used to coat, encapsulate, impregnate, or surface modify a particle, but may function in other capacities, e.g., a filler, plasticizer, solvent, etc.

**186.32 Contains Group IA metal peroxide:**

This subclass is indented under subclass 186.27. Composition which contains a Group IA metal peroxide (Li, Na, K, Rb, Cs), e.g., a composition comprised of sodium percarbonate coated with aqueous sodium silicate solution, etc.

**186.33 Contains Group VIIB or Group VIII metal or compound thereof:**

This subclass is indented under subclass 186.25. Composition which contains a Group VIIB metal (Mn, Tc, Re) or Group VIII metal (Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt) or compound thereof, e.g., a composition comprised of zinc oxide particles coated with silver permanganate, etc.

**186.34 Contains organohalogen compound as oxidant:**

This subclass is indented under subclass 186.25. Composition which contains an organohalogen compound as the oxidizing or oxygen generating agent, e.g., N, N1 -di (2, 4, 6 - trichlorophenyl) -N, N1 -di - chlorourea stabilized with zinc oxide, etc.

**186.35 Chloroisocyanurate:**

This subclass is indented under subclass 186.34. Composition which contains chloroisocyanurates as the organohalogen-type oxidant, e.g., a composition comprised of trichloroisocyanuric acid stabilized with magnesium sulfate, etc.

**186.36 Contains free halogen or oxy-halogen acid type:**

This subclass is indented under subclass 186.25. Composition which contains an oxy-halogen acid compound, an anhydride thereof, free halogen, or a compound which yields such a halogen body when treated with water, basic material, nonhalogen acid, or heat, e.g., a composition comprised of aqueous sodium hypochlorite stabilized against trace amounts of iron impurities with calcium chloride and sodium carbonate, etc.

**186.37 Contains alkaline earth metal:**

This subclass is indented under subclass 186.36. Composition which contains a Group IIA metal (Be, Mg, Ca, Sr, Ba), e.g., a composition comprised of calcium hypochlorite core

coated with a mixture of calcium hypochlorite dihydrate and sodium chloride, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

625+, radioactive compositions which contains radium in admixture with materials normally classified in this subclass.

**186.38 Contains activator admixed with inorganic peroxide:**

This subclass is indented under subclass 186.1. Composition which contains an activator admixed with an inorganic peroxide, i.e., a material which enhances or assists in the decomposition of the peroxide, e.g., a bleaching composition comprised of an aqueous solution of hydrogen peroxide admixed with a carboxylic acid anhydride, etc.

**186.39 Contains heterocyclic compound:**

This subclass is indented under subclass 186.38. Composition which contains a heterocyclic compound, e.g., a composition comprised of hydrogen peroxide and 1-acetyl - 5, 6 - dihydrouacil, etc.

**186.4 Oxygen heterocycle:**

This subclass is indented under subclass 186.39. Composition which contains an oxygen heterocycle, e.g., a composition comprised of sodium perborate and beta-propiolactone, etc.

**186.41 Hydrogen peroxide:**

This subclass is indented under subclass 186.38. Composition which contains hydrogen peroxide admixed with an activator, e.g., a composition comprised of hydrogen peroxide and sodamide, etc.

**186.42 Contains organic peroxide:**

This subclass is indented under subclass 186.1. Composition which contains an organic peroxide, e.g., a composition comprised of monoperoxyphthalic acid and magnesium sulfate, etc.

**186.43 Contains inorganic peroxide:**

This subclass is indented under subclass 186.1. Composition which contains an inorganic peroxide, e.g., a composition comprised of hydrogen peroxide and a fabric discoloration

inhibitor, 3-Salicyloylamido benzimidazole, etc.

**186.44 Contains inorganic nitrogen containing compound:**

This subclass is indented under subclass 186.1. Composition which contains an inorganic nitrogen containing compound, e.g., a composition comprised of sodium hypochlorite and the surface active agent, C-decyl-N-tri-methyl-alpha-betaine, etc.

**187.1 Free halogen or oxy-halogen acid type:**

This subclass is indented under subclass 186.1. Composition which contains an oxy-halogen acid compound, an anhydride thereof, free halogen, or a compound which yields such a halogen body when treated with water, basic material, nonhalogen acid, or heat, e.g., a bleaching composition comprised of perchloric acid and polyvinylpyrrolidone, etc.

**187.2 Oxidant contains halogen other than chlorine:**

This subclass is indented under subclass 187.1. Composition which contains a halogen oxidant other than chlorine, e.g., a cleaning composition comprised of iodine and ethylene glycol, etc.

**187.21 Chlorine dioxide or monoxide:**

This subclass is indented under subclass 187.1. Composition which contains chlorine dioxide or monoxide, e.g., a composition comprised of chlorine monoxide and 1, 1, 1-trichloroethane, etc.

**187.22 With elemental chlorine:**

This subclass is indented under subclass 187.21. Composition which contains elemental chlorine, e.g., an aqueous composition comprised of chlorine dioxide and chlorine, etc.

**187.23 Chlorite:**

This subclass is indented under subclass 187.1. Composition which contains a chlorite salt, e.g., a composition comprised of sodium hypochlorite admixed with sodium chloride, etc.

**187.24 Hypochlorite:**

This subclass is indented under subclass 187.23. Composition which contains a hypochlorite salt, e.g., a composition com-

prised of sodium hypochlorite admixed with magnesium oxide, etc.

**187.25 Alkali metal hypochlorite:**

This subclass is indented under subclass 187.24. Composition which contains a Group IA metal hypochlorite salt (Li, Na, K, Rb, Cs), e.g., a dustless bleaching composition comprised of lithium hypochlorite, sodium chloride, and chlorinated biphenyl, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

625+, radioactive compositions which contains francium in admixture with materials normally classified in this subclass.

**187.26 Sodium:**

This subclass is indented under subclass 187.25. Composition which contains the hypochlorite in the form of its sodium salt, e.g., a composition comprised of sodium hypochlorite and magnesium silicate, etc.

**187.27 Alkaline earth metal hypochlorite:**

This subclass is indented under subclass 187.24. Composition which contains a Group IIA metal hypochlorite (Be, Mg, Ca, Sr, Ba), e.g., a composition comprised of magnesium hypochlorite and citric or tartaric acid as solubilizing agent, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

625+, radioactive compositions for compositions which contain radium in admixture with materials normally classified in this subclass.

**187.28 Calcium:**

This subclass is indented under subclass 187.27. Composition which contains a hypochlorite in the form of its calcium salt, e.g., a composition comprised of calcium hypochlorite and sodium chloride filler, etc.

**187.29 With alkali metal compound:**

This subclass is indented under subclass 187.28. Composition which contains in addition to calcium hypochlorite a Group I A metal compound (Li, Na, K, Rb, Cs), e.g., a composition comprised of calcium hypochlorite, calcium oxide and sodium carbonate, etc.

**187.3 With alkaline earth metal compound:**

This subclass is indented under subclass 187.28. Composition which contains in addition to the calcium hypochlorite a Group IIA metal compound (Be, Mg, Ca, Ba, Sr), e.g., a composition comprised of calcium hypochlorite and sodium stearate as lubricant, etc.

**187.31 Chlorate or perchlorate:**

This subclass is indented under subclass 187.1. Composition which contains a chlorate or perchlorate salt as an oxidizing agent, e.g., a composition comprised of sodium chlorate and sodium chloride, etc.

**187.32 Hypochlorous acid:**

This subclass is indented under subclass 187.1. Composition which contains hypochlorous acid, e.g., a solution of hypochlorous acid in methyl ethyl ketone, etc.

(1) Note. Hypochlorous acid compositions claimed in terms of their precursors are classified on the latter whenever possible.

**187.33 Oxidant contains N-C1 bond:**

This subclass is indented under subclass 187.1. Composition which contains a compound containing a nitrogen-to-chlorine bond, as a hypochlorite precursor, e.g., a bleaching composition comprised of 1, 3 - di-chloro - 5, 5 - dimethylhydantoin and tetrasodium pyrophosphate buffer, etc.

**187.34 Chloroisocyanurate:**

This subclass is indented under subclass 187.33. Composition which contains chloroisocyanurates, e.g., a composition comprised of dichlorisocyanurate and a carrier, sodium sulfate, etc.

**188.1 REDUCTIVE BLEACHANT, DEOXIDANT, REDUCTANT, OR GENERATIVE:**

This subclass is indented under the class definition. Composition which contains substances for use in bleaching by chemical reduction, in deoxygenation, or in other chemical reductions of extraneous substances or in generating hydrogen, or in making substances for such use, or in processes of making such compositions or mere method of using such compositions.

- (1) Note. A material qualifies as a reducing agent either if it is so claimed, disclosed or otherwise art-recognized as such.
- (2) Note. This subclass and its indents take compositions which are claimed as detergents, but which recite only a reductant and do not recite detergent-type ingredients.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 70, for a reversible, heat generating composition containing a reductant or deoxygenating material.
- 178, for water softening or purifying or scale inhibiting agent containing a deoxidant.
- 184, for compositions which are also chemically yielding.
- 372+, for gaseous compositions containing a reductant (e.g.,  $H_2 + CO$ ).
- 410+, for compositions containing a reductant and claimed or solely disclosed as a catalyst. Included herein are oxygen scavenging or deoxidant compositions which function by physical adsorption or absorption; where the absorptive or adsorptive process is unclear or unspecified as being either physical or chemical, the assumption will be made that the process is physical.

SEE OR SEARCH CLASS:

- 8, Bleaching and Dyeing: Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 101+ for processes of bleaching or decolorizing textiles and which are other than the mere application of a novel reducing bleach composition.
- 44, Fuel and Related Compositions, appropriate subclasses for those reducing agents which can be considered fuels.
- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Particulate Mixtures, appropriate subclasses for loose mixtures of metal powders.

- 149, Explosive and Thermic Compositions or Charges, appropriate subclasses for fuel intended for blasting, firearms, jet propulsion of rockets, vehicles, rapidly filling automotive passenger restraining gas bags, chemical lasers, etc. Included in this class are propellants which, upon initiation, are capable of undergoing a chemical change at a relatively high rate of speed. The class also provides for compositions which utilize a reducing agent to produce usable heat in an irreversible or nonregenerating manner.
- 210, Liquid Purification or Separation, subclasses 749+ for processes of chemically treating a liquid for the purpose of purifying the liquid using a deoxygenating or reducing composition; subclass 750 for a method of removing dissolved oxygen from water using alkylhydrazines.
- 260, Chemistry of Carbon Compounds, appropriate subclasses for organic compounds, per se, which may be reductive and admixtures of such compounds with agents designed to improve the stability of such a compound.
- 420, Alloys or Metallic Compositions, appropriate subclasses for powder of a single metal and for powder of an alloy or metallic composition.
- 423, Chemistry of Inorganic Compounds, subclasses 265+ for an inorganic compound, which may be reductive, admixed with an agent designed to improve the stability of such a compound.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, for cleaning compositions, particularly subclasses 247+ for deoxidant containing descaling agents and subclasses 302+ and 367+ for compositions including a chemical bleach component which is a reducing agent.
- 520, Synthetic Resins or Natural Rubber, appropriate subclasses for treating a resin with a reducing agent.

**188.2 Sulfur containing reductant, bleachant, deoxidant, or generative:**

This subclass is indented under subclass 188.1. Composition which contains a sulfur containing reductive bleachant, deoxidant, reductant, or generative, e.g., a reductive bleaching composition comprised of sodium formaldehyde sulfoxylate and zinc sulfate, etc.

**188.21 Sulfite:**

This subclass is indented under subclass 188.2. Composition which contains a sulfite, e.g., a dye-reducing aqueous composition comprised of sodium borohydride and sodium sulfite, etc.

**188.22 Hydrosulfite (dithionite):**

This subclass is indented under subclass 188.21. Composition which contains the specific hydrosulfite (dithionite) salt, i.e., (S2 O4)-2, e.g., an oxygen consuming composition comprised of sodium dithionite (Na2 S2 O4) and sodium sulfate, etc.

**188.23 With organic additive:**

This subclass is indented under subclass 188.22. Composition which contains an organic additive e.g., a reducing composition comprised of sodium dithionite and zinc hydroxymethanesulfinate, etc.

**188.24 Contains nitrogen:**

This subclass is indented under subclass 188.23. Composition which contains either an organic or inorganic nitrogen containing additive, e.g., a reducing composition which contains an aqueous dispersion of sodium dithionite (also known as hydrosulfites or hyposulfites) and ammonium chloride as a solubility suppressant, etc.

**188.25 Hydrogen generating:**

This subclass is indented under subclass 188.1. Composition which generates hydrogen, i.e., one which either contains or is designed to supply through chemical action hydrogen, e.g., a hydrogen generating composition consisting essentially of lithium hydride particles suspended in a liquid mixture of pyridine and benzene, etc.

- (1) Note. For patents to be placed here there must be a positive recitation that the composition generates hydrogen.

- (2) Note. The ionization of hydrogen containing materials is not considered as a hydrogen generating process and therefore not classified here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

188.26, for a reducing composition of Li H particles suspended in a mixture of benzene and pyridine for which mixture there is no positive recitation of hydrogen generation.

**188.26 Hydride containing:**

This subclass is indented under subclass 188.1. Composition which contains a hydride, i.e., a more positive element which contains the H<sup>-</sup> anion, e.g., Li H, CaH<sub>2</sub>, Li AlH<sub>4</sub>, etc.

**188.27 Contains Al to H bond:**

This subclass is indented under subclass 188.26. Composition which contains a compound with an aluminum-to-hydrogen bond, e.g., a reducing composition comprising, a solution of Na Al H<sub>2</sub> (O CH<sub>2</sub> CH<sub>2</sub> - N(CH<sub>3</sub>)<sub>2</sub>)<sub>2</sub> in tetra-hydrofuran, etc.

**188.28 Deoxidant or oxygen scavenging:**

This subclass is indented under subclass 188.1. Composition which functions to remove oxygen by chemical means, e.g., an oxygen scavenger composition which consists of metallic iron, silicic acid, sodium bromide, and calcium sulfate filler, etc.

**189** This subclass is indented under the class definition. Compositions which contain substances for, or peculiar to, use in chemically absorbing or binding extraneous CO, S, negative elements, acids, or acid-anhydrides (includes salts of weak acids).

SEE OR SEARCH CLASS:

510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses, particularly 220+, 272+, 339+, 435, etc., for cleaning compositions containing an alkaline component.

- 190** This subclass is indented under subclass 189. Compositions which contain an adsorbent.
- 191** This subclass is indented under subclass 189. Compositions which contain elementary iron, or an oxide of iron, or other basic iron compound.
- 192** This subclass is indented under subclass 189. Compositions which contain significant amounts of an alkali-metal or a compound thereof.
- SEE OR SEARCH CLASS:  
8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, for mercerizing compositions.
- 193** This subclass is indented under the class definition. Compositions which contain substances for, or peculiar to, use in chemically absorbing or binding extraneous metals, ammonia, alkalis, or other extraneous bases, or in making substances for such use.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
179, for base exchange compositions for water softening or scale inhibiting.
- SEE OR SEARCH CLASS:  
210, Liquid Purification or Separation, subclasses 696+ for liquid treating processes which prevent, decrease or delay precipitation.  
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses for setting bath compositions disclosed to be solely for the purpose of precipitation or formation of articles, e.g., filaments from a spinning or article forming composition extruded or spun thereinto, for example, see subclasses 183+.  
423, Chemistry of Inorganic Compounds, subclasses 700+ for zeolites and appropriate subclasses for aluminosilicate compounds having base-exchange capabilities.  
510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses, particularly subclass 253, 255, 257, 258+, 269+, etc., for cleaning compositions containing an acid component.
- 194** This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to, use in absorbing, binding, removing, retaining, or emitting water, or maintaining water concentrations within certain ranges, excepting mere adsorbents and mere analytical, testing, or indicating compositions.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
181.1, for getters for electric lamps, electric space discharge devices, and other evacuated or gas or vapor filled containers which are designed to absorb, bind, remove, or retain water vapor from the atmosphere in the container.  
408, for analytical, testing, or indicating compositions.
- SEE OR SEARCH CLASS:  
502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, for a composition comprising a catalyst which may be used in or as an incandescent mantle composition.  
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 98+ for colloid systems of continuous or semicontinuous solid phase with discontinuous liquid phase (gels, pastes, flocs, coagulates) or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.
- 521, Synthetic Resins or Natural Rubbers, subclasses 25+ for solid polymeric ion-exchange materials, processes of preparing or regenerating them.



**299.01 LIQUID CRYSTAL COMPOSITIONS:**

This subclass is indented under the class definition. Compositions containing a mesomorphic state of matter which is intermediate between a crystalline solid and a normal isotropic liquid; they resemble liquids mechanically (as to viscosity) but crystals optically (light scattering and reflection).

- (1) Note. The combination of a liquid crystal composition and structure is classified with the class providing for the structure.

**SEE OR SEARCH CLASS:**

- 40, Card, Picture, or Sign Exhibiting, subclass 448 for display devices using liquid crystals.
- 250, Radiant Energy, subclass 331 for nonchemical infrared imaging including liquid crystal detector.
- 345, Computer Graphics Processing, Operator Interface Processing, and Selective Visual Display Systems, subclass 38, 50+, and 87+ for selective electrical control of liquid crystal display devices.
- 349, Liquid Crystal Cells, Elements and Systems, subclasses 1+ and 182+, respectively wherein a particular liquid crystal composition is used.
- 360, Dynamic Magnetic Information Storage or Retrieval, for liquid crystal used to store or retrieve dynamic information stored magnetically.
- 365, Static Information Storage and Retrieval, subclass 108 for liquid crystal used to store or retrieve static information.
- 368, Horology: Time Measuring Systems or Devices, subclass 30, 84, and 242 for timepieces using liquid crystal compositions.
- 428, Stock Material or Miscellaneous Articles, subclass 1 for liquid crystal stock material, i.e., a composition having structure provided for by the class.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, appropriate subclasses for radiation imagery chemistry involving

a process, product, or composition using a liquid crystal.

- 436, Chemistry: Analytical and Immunological Testing, subclasses 1+ for analytical and analytical control processes employing liquid crystals.

- 552, Organic Compounds, particularly subclasses 502+ for organic compounds having liquid crystal properties.

**299.1 Containing pleochroic dye:**

This subclass is indented under subclass 299.01. Compositions containing a dye capable of variable absorption of light, e.g., colorless to colored, colorless to fluorescent, etc.

**299.2 Containing dopant salt:**

This subclass is indented under subclass 299.01. Compositions containing a minor amount of salt added to a liquid crystalline material.

**299.3 Containing charge-transfer agents:**

This subclass is indented under subclass 299.01. Compositions containing charge carriers of the redox type, etc.

**299.4 Containing nonchiral aligning agents:**

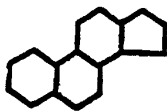
This subclass is indented under subclass 299.01. Compositions containing additives not optically active which promote the alignment of the composition relative to the cell walls of the device containing the same.

**299.5 Containing nonchiral additive having no specified mesophase:**

This subclass is indented under subclass 299.01. Compositions containing additives not optically active which do not have liquid crystal properties, e.g., liquids which improve the viscosity, response time, anisotropy, etc.

**299.6 Containing nonsteryl liquid crystalline compound of specified structure:**

This subclass is indented under subclass 299.01. Compositions containing a liquid crystal compound of specified chemical structure for which a definite structural formula can be drawn and which does not contain the cyclopentanophenanthrene nucleus, i.e.,



- (1) Note. A polymer which is not of a single molecular species and is identifiable as an average of various molecular species is excluded herefrom. A polymer which is a single molecular species, e.g., dimer, etc., is included hereunder. The recitation "polymer" will be presumed to be material of no single molecular species in the absence of specific contrary disclosure.

**299.61 Including heterocyclic ring:**

This subclass is indented under subclass 299.6. Compositions wherein the liquid crystal compound has a ring of three or more members, at least one of which is carbon and one or more members selected from nitrogen or chalcogen.

**299.62 Including fused or bridged rings:**

This subclass is indented under subclass 299.6. Compositions wherein the liquid crystal compound has at least two rings with two or more carbon atoms in common, i.e., polycyclic rings.

**299.63 Including fully saturated ring:**

This subclass is indented under subclass 299.6. Compositions wherein the liquid crystal compound has a carbocyclic ring which does not have any carbon to carbon unsaturation.

**299.64 Aryl ester of aryl acid having three benzene rings:**

This subclass is indented under subclass 299.6. Compositions wherein the liquid crystal compound has an acid containing a benzene ring which is attached through its acid function to the radical derived by the removal of -OH from an alcohol containing a benzene ring. The compound must also contain three or more benzene rings.

**299.65 Benzene rings linked by direct bond:**

This subclass is indented under subclass 299.64. Compositions wherein the liquid crystal ester compound having three or more benzene rings also has at least two benzene rings linked together by a direct bond.

**299.66 Benzene rings linked by direct bond:**

This subclass is indented under subclass 299.6. Compositions wherein the liquid crystal compound has at least two benzene rings linked together by a direct bond.

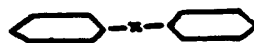
**299.67 Phenyl benzoate derivative:**

This subclass is indented under subclass 299.6. Compositions wherein the liquid crystal compound is a ring substituted derivative of



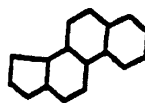
**299.68 Including benzene rings bonded through azo, azoxy, or azomethine linkage:**

This subclass is indented under subclass 299.6. Compositions wherein the liquid crystal compound is a ring substituted derivative of the structure illustrated below, wherein X is -CH=N-, -N=N-, or -NO-N-.



**299.7 Cholesteric liquid crystal composition containing a sterol derivative:**

This subclass is indented under subclass 299.01. Compositions having a cholesteric containing compound which is a derivative of the structure



**301.16** This subclass is indented under the class definition. Compositions which contain an organic substance having the property of emitting light or analogous rays as a result of irradiation by wave energy radiated by some other source.

- (1) Note. In this subclass are placed patents directed to compositions which contain ingredients which require excitation to become fluorescent or phosphorescent.

SEE OR SEARCH THIS CLASS, SUBCLASS:

62.51+, for luminescent magnetic compositions.

301.1, for luminescent compositions containing substances which are spontaneously radioactive.

700, for chemiluminescent compositions.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclass 302 for radiation tracer methods including fluorescent and phosphorescent tracer materials, subclasses 361+ for invisible radiant energy responsive signaling devices which include a fluorescent or phosphorescent detector responsive to the invisible radiation, subclass 458.1 for methods and apparatus to irradiate fluorescent and phosphorescent devices, and subclass 483.1 for fluorescent and phosphorescent devices.

260, Chemistry of Carbon Compounds, appropriate subclasses for luminescent organic compounds, per se.

313, Electric Lamp and Discharge Devices, subclass 92 for cathode ray tubes having a fluorescent or phosphorescent screen or target, and subclasses 483+ for electric lamps and space discharge devices which include a fluorescent or phosphorescent substance as a part thereof.

362, Illumination, subclass 84 for illuminating devices in combination with fluorescent or phosphorescent material.

427, Coating Processes, subclasses 157+ for processes of making a luminescent coating.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 139 for luminescent imagery.

508, Solid Antifriction Devices, Materials Therefor, Lubricant and Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, particularly subclasses 110+, for lubricating oils containing fluorescent ingredients.

520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Class 523, subclass 161 for a composition containing a synthetic resin or natural rubber having utility as an invisible, ballpoint, or typewriter ink or to processes of preparing said composition.

**301.17** This subclass is indented under subclass 301.16. Compositions in which the luminescent material either (1) can be stimulated to emit coherent light or other electromagnetic radiation, i.e., optical maser, or (2) luminesces under exposure to ionizing radiation, i.e., radio-photoluminescent.

SEE OR SEARCH CLASS:

117, Single-Crystal, Oriented-Crystal, and Epitaxy Growth Processes; Non-Coating Apparatus Therefor, for processes and non-coating apparatus for growing therein-defined single-crystal of all types of materials, including those which may be suitable as or to produce a lasing or scintillating composition. Class 118 generally provides for coating apparatus, including single-crystal (e.g., epitaxy) coating means.

372, Coherent Light Generators, appropriate subclasses for lasers.

**301.18** This subclass is indented under subclass 301.17. Compositions which contain a metal having a specific gravity greater than four.

**301.19** This subclass is indented under subclass 301.16. Compositions which are to be employed as flaw penetrants for detecting surface discontinuities in test bodies.

**301.21** This subclass is indented under subclass 301.16. Compositions which are to be applied to or incorporated in materials in order to obtain a bleaching effect or a whiter appearance in daylight.

**301.22** This subclass is indented under subclass 301.21. Compositions which contain a heterocyclic compound having two cyclic nuclei joined together through a straight chain linkage containing at least one methine group.

**301.23** This subclass is indented under subclass 301.22. Compositions in which the compound contains a six-membered ring consisting of three ring carbons and three ring nitrogens.

**301.24** This subclass is indented under subclass 301.22. Compositions in which the compound contains a five-membered ring having at least two hetero atoms of which one is nitrogen and the other is either oxygen or sulfur.

**301.25** This subclass is indented under subclass 301.21. Compositions which contain a heterocyclic compound having a six-membered ring with at least two hetero atoms, at least one of which is nitrogen.

SEE OR SEARCH CLASS:

544, Organic Compounds, for compounds, per se, having a six-membered ring consisting of four ring carbons and two ring hetero atoms, at least one of which is nitrogen.

**301.26** This subclass is indented under subclass 301.21. Compositions which contain a heterocyclic compound having a hexatomic ring made up of five carbon atoms and one nitrogen atom.

SEE OR SEARCH CLASS:

546, Organic Compounds, subclasses 1+ for compounds, per se, having a six-membered ring consisting of five ring carbons and one ring nitrogen.

**301.27** This subclass is indented under subclass 301.21. Compositions which contain a heterocyclic compound having a five-membered ring having at least two hetero atoms, at least one of which is a nitrogen atom.

SEE OR SEARCH CLASS:

548, Organic Compounds, subclasses 100+ for azole compounds, per se.

**301.28** This subclass is indented under subclass 301.27. Compositions in which the ring also contains sulfur or oxygen.

SEE OR SEARCH CLASS:

548, Organic Compounds, appropriate subclasses for thiazole and oxazole compounds, per se.

**301.29** This subclass is indented under subclass 301.27. Compositions in which the ring contains three or four nitrogen atoms.

SEE OR SEARCH CLASS:

548, Organic Compounds, subclasses 250 through 269.4 for tri- or tetrazole compounds, per se.

**301.31** This subclass is indented under subclass 301.21. Compositions which contain a heterocyclic compound having a pentatomic ring made up of four carbon atoms and one nitrogen atom.

SEE OR SEARCH CLASS:

548, Organic Compounds, subclasses 400+ for compounds, per se, having a five-membered ring composed of four carbon atoms and one nitrogen atom.

**301.32** This subclass is indented under subclass 301.21. Compositions which contain a heterocyclic compound which contains either oxygen or sulfur as a hetero atom.

SEE OR SEARCH CLASS:

549, Organic Compounds, subclasses 1+ for sulfur containing hetero rings and subclasses 200+ for hetero-O-atom compounds, per se.

**301.33** This subclass is indented under subclass 301.16. Compositions which contain an inorganic material which is luminescent in addition to the organic luminescent material.

**301.34** This subclass is indented under subclass 301.16. Compositions which includes (1) a film forming material which occurs in nature

(2) "cellulose" which is a carbohydrate material derived from the structural matter of plant life including lignocellulose, cotton and modified forms such as cellophane and rayon or (3) cellulosic derivatives such as cellulose esters or ethers.

**301.35** This subclass is indented under subclass 301.16. Compositions which include a synthetic resin.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, the Class Definition for a discussion of "synthetic resin."

523, Synthetic Resins or Natural Rubbers, subclass 136 for a composition containing a synthetic resin or natural rubber which is resistant to, yet does not absorb, radioactive materials or cathode rays or to processes of preparing said composition.

**301.36** This subclass is indented under the class definition. Compositions which contain an inorganic material having the property of emitting light or analogous rays as a result of irradiation by wave energy radiated by some other source, and an organic material which does not have such a property.

SEE OR SEARCH THIS CLASS, SUBCLASS:

301.4+, and 301.16+, for organic and other inorganic luminescent compositions respectively, and see the search notes therein for itemization of other possible pertinent fields of search.

**301.4 INORGANIC LUMINESCENT COMPOSITIONS:**

This subclass is indented under the class definition. Compositions which are constituted entirely of inorganic material and contain a component having the property of emitting light or analogous rays as a result of irradiation by wave energy radiated by some other source.

(1) Note. This and the indented subclasses also include compositions in the preparation of which a temporary organic vehicle, binder or adjuvant is employed and which is removed or destroyed in the course thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

301.16, and 301.36, for luminescent compositions containing organic material which may include inorganic luminescent material; and see the search notes therein for itemization of other possibly pertinent fields of search.

SEE OR SEARCH CLASS:

423, Chemistry of Inorganic Compounds, appropriate subclasses, for inorganic luminescent compounds, per se.

**301.5** This subclass is indented under subclass 301.4. Compositions which contain tungsten in combined or elemental form.

SEE OR SEARCH CLASS:

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclass 248 for a consolidated metal powder composition having a noble metal or copper base.

**301.6** This subclass is indented under subclass 301.4. Compositions which contain zinc or cadmium in combined or elemental form.

**363.5** This subclass is indented under the class definition. Compositions in which each contains a main substance present as a solid phase and a second substance incorporated or associated therewith for accelerating the rate of solution or dispersion of the main substance in a fluid, and processes of making the same.

(1) Note. For compositions containing substances in a granular state and agents associated therewith for inhibiting caking of the granules, search where the substances are classifiable respectively.

SEE OR SEARCH CLASS:

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, for compositions each of which contains a main solid substance and a second substance associated therewith for stabilizing or accelerating

ing colloidal dispersion of the main substance.

- 364** This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to use as solvents.

SEE OR SEARCH THIS CLASS, SUBCLASS:

69, for solvents for volatile refrigerants.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, subclass 311 for vehicles or solvents for use in the production of coating or plastic compositions.

510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses, particularly subclass 118, 177+, 201+, and 405+, for cleaning compositions which include solvents.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (364).

- 365** This subclass is indented under the class definition. Compositions which in each case contain a substance as a base and another substance (denaturant) for preventing or hindering use of the base substance as a beverage or ingestion thereof, materials (denaturants) for use as such other substances, or processes of making such compositions or materials.

SEE OR SEARCH CLASS:

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (365) and its indented subclasses.

- 366** This subclass is indented under subclass 365. Compositions in which in each case the base substance contains an alcohol.

SEE OR SEARCH CLASS:

44, Fuel and Related Compositions, subclasses 266+ for solidified alkanol, and subclasses 402, 411, 438, 446, and 451+ for liquid fuels containing alkanol.

**367.1 SOAPS (I.E., ALKALI-METAL SALTS OF WATER-INSOLUBLE FATTY ACIDS OR OF ROSIN ACIDS):**

This subclass is indented under the class definition. Compositions which include an alkali-metal (i.e., Li, Na, K, Rb, or Cs) salt of an unsubstituted or hydroxy-substituted, saturated or unsaturated, higher fatty acid, or of rosin (abietic) acid, which are of general utility and lack any shape or structure to adapt them for use as cleaning agents; or processes of preparing such compositions.

- (1) Note. A higher fatty acid is a water-insoluble monocarboxylic acid having an acyclic chain of at least seven carbons attached directly to the carboxyl group by nonionic bonding.
- (2) Note. The compositions in this class frequently include salts of mixtures of fatty acids derived from different natural sources, such as two or more vegetable or fish oils, animal fats, etc.
- (3) Note. The compositions included herein are, for example, used in well-drilling fluids, used in lubricant compositions, combined with other components, or refined for use as detergents and the like.

**SEE OR SEARCH CLASS:**

- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses, particularly subclasses 152+, 447+, 481+, etc., for soap-containing cleaning compositions.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems;

compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (367.1).

- 554, Organic Compounds, appropriate subclasses, for higher fatty acid salts, per se.

**372** This subclass is indented under the class definition. Compositions which are gaseous, or processes of making them.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 181.5, for gaseous getters for electric lamps, electric space discharge devices and other evacuated or gas or vapor filled containers.

**SEE OR SEARCH CLASS:**

- 48, Gas: Heating and Illuminating, for processes of, and apparatus for, making producer gas, water-gas or other fuel gases.
- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 300+ for gaseous compositions used in metallurgical processes.
- 313, Electric Lamp and Discharge Devices, subclasses 567+ for electric lamps and electric space discharge devices (e.g., radio tubes) which have an envelope containing a gas and/or vapor composition.
- 424, Drug, Bio-Affecting and Body Treating Compositions, appropriate subclass for a gaseous anesthetic composition classified on the basis of the anesthetically active compound.

- 514, Drug, Bio-Affecting and Body Treating Compositions, appropriate subclasses for a gaseous anesthetic composition classified on the basis of the anesthetically active compound; subclass 789 for a life-supporting gaseous composition, e.g., deep-sea breathing gases, etc.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 1+ for continuous gas or vapor phase colloid system (e.g., smoke, fog, aerosol, cloud, mist) or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (372) and its indented subclasses.
- 373** This subclass is indented under subclass 372. Compositions which contain significant amounts of both carbon monoxide, or carbon-dioxide, and hydrogen, or processes of making such compositions.
- SEE OR SEARCH CLASS:
- 48, Gas: Heating and Illuminating, especially subclass 198.1, for process claims deriving the gaseous mixture from a hydrocarbon gas, and no product claim is present.
- 518, Chemistry: Fischer-Tropsch Processes; or Purification or Recovery of Products Thereof, for processes of reacting carbon oxides with hydrogen and the products thereof.
- 374** This subclass is indented under subclass 372. Compositions which in each case contain significant amounts of both nitrogen and hydrogen, or processes of making such compositions.
- 375** This subclass is indented under subclass 374. Compositions in which the direct source of the nitrogen is air or elementary nitrogen only and the direct source of the hydrogen is wholly or partly a chemical compound of hydrogen.
- 376** This subclass is indented under subclass 375. Compositions in which the direct source of the hydrogen is wholly or partly hydrocarbon matter.
- 377** This subclass is indented under subclass 374. Compositions in which the direct sources of the nitrogen and hydrogen are elementary nitrogen and hydrogen only, processes of making such compositions, or processes of purifying compositions which individually contain both elementary nitrogen and elementary hydrogen.
- 378** This subclass is indented under the class definition. Processes of exfoliating or intumescing vermiculite, other micaceous substances, or other materials, or the products of such processes.
- SEE OR SEARCH CLASS:
- 99, Foods and Beverages: Apparatus, subclass 323.4 for apparatus for puffing or intumescing cereal foods.
- 106, Compositions: Coating or Plastic, appropriate subclasses particularly subclass 122, 601+ and 672+ for coating or plastic compositions containing expanded materials, and subclasses 417+ for micaceous pigments or fillers.
- 125, Stone Working, subclasses 23.01+ for processes of or apparatus for splitting mica or other materials.
- 241, Solid Material Comminution or Disintegration, subclass 4 for processes of comminuting micaceous substances.
- 426, Food or Edible Material: Processes, Compositions, and Products, appropriate subclasses for puffing or intumescing food grain.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in mak-



ing or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (378).

**380** This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to, use as or in agents or materials for preventing, inhibiting or reducing chemical or physical changes in other substances or bodies when incorporated or associated therewith, and processes of making the same, excepting compositions and processes of making them which are primarily for use as analytical, testing, or indicating compositions.

- (1) Note. This subclass and indented subclasses take old compounds limited to use as preserving agents and also the combination of a preserving agent with the substance preserved where such substance is so broadly claimed as not to afford a basis of classification, e.g., "an organic substance."
- (2) Note. For compositions, or processes of making them, each of which contains a main substance and an agent for inhibiting caking of granules of, chemical decomposition of, or other chemical or physical change of, the main substance, search where the main substance is classifiable.

SEE OR SEARCH THIS CLASS, SUBCLASS:

71, for compositions specialized and designed for, or peculiar to, use in heat exchanges or which are low-freezing (freezing point depressing) or high-boiling (boiling point elevating), or which are adapted to form

mixtures having a lower pour-point or freezing point when mixed with other substances.

601+, for fire-proofing compositions.

SEE OR SEARCH CLASS:

- 106, Compositions: Coating or Plastic, for protective coating or impregnating compositions.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, appropriate subclasses for processes for disinfecting, deodorizing, preserving, or sterilizing.
- 424, Drug, Bio-Affecting and Body Treating Compositions, for a composition for repelling, inhibiting or destroying a pest such as bacteria, fungus, etc.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (380) and its indented subclasses.

**381** This subclass is indented under subclass 380. Compositions specialized and designed for or peculiar to use as or in agents for preventing, inhibiting or reducing caking of granular material, or use in the form of distinct coating blan-

- kets, layers or zones with respect to the materials with which they are associated respectively.
- (1) Note. For compositions each of which contains a main substance and an agent for inhibiting caking of granules of the main substance, search where the main substance is classifiable.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 2+, for fire extinguishing.  
 601+, for fire-retarding agents.
- SEE OR SEARCH CLASS:  
 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 303+ for solid treating compositions for molten metal and subclass 709 for processes of covering the surface of molten metal with a material to prevent contact with the ambient atmosphere.  
 106, Compositions: Coating or Plastic, for coating compositions.  
 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 40+ for process of storage or protection using a protective layer over the material being stored or protected.
- 382** This subclass is indented under subclass 381. Compositions which are essentially foams, liquids, or other fluids.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 3, for fire extinguishing foams.  
 8.1, for fire preventing foams.  
 62, for heat-insulating compositions.
- 383** This subclass is indented under subclass 381. Compositions each of which contains both an organic compound and an inorganic compound or element.
- 384** This subclass is indented under subclass 381. Compositions which contain organic compounds.
- 385** This subclass is indented under subclass 381. Compositions which contain inorganic compounds or elements.
- 387** This subclass is indented under subclass 380. Compositions specialized and designed for, or peculiar to, use as or in agents for preventing, inhibiting, or reducing, corrosion or chemical attack of solid metals, or other solid materials, of receptacles or apparatus.
- (1) Note. For compositions each of which contains a main substance and an agent for inhibiting corrosion by the main substance, search where the main substance is classifiable.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 381+, for anti-caking, separative, or protective coatings or zones.  
 397+, for agents which inhibit corrosion by inhibiting formation of corrosive products of chemical change.
- SEE OR SEARCH CLASS:  
 106, Compositions: Coating or Plastic, particularly subclass 14.05, for corrosion-inhibiting coating compositions.  
 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 7+ for process of maintaining an environment nondestructive to metal.  
 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, subclass 255, 258+, 335+, 401+, etc., for cleaning compositions that include anticorrosion agents.
- 388** This subclass is indented under subclass 387. Compositions which contain organic compounds.
- 389.1** **Component inorganic or organic comprising element other than C,H,O,N,S, and halogen:** This subclass is indented under subclass 388. Compositions comprising either an inorganic compound or an organic compound which includes an element other than carbon, hydrogen, oxygen, nitrogen, sulfur or a halogen

(i.e., fluorine, chlorine, bromine, iodine and astatine).

**389.2 Phosphorus containing:**

This subclass is indented under subclass 389.1. Compositions which includes a compound containing an atom of the element phosphorus.

- (1) Note. This subclass is the location for phosphoric and polyphosphoric acids and esters and other derivatives thereof.

**389.21 Nitrogen and/or sulfur in phosphorus compound:**

This subclass is indented under subclass 389.2. Compositions in which the compound which includes an atom of phosphorus also includes an atom of the element nitrogen, or the element sulfur, or both nitrogen and sulfur.

**389.22 Pentavalent P, except  $H(n+2)PnO(3n+1)$ :**

This subclass is indented under subclass 389.21. Compositions in which the Phosphorus containing compound includes pentavalent Phosphorus, such as phospho and phosphono compounds, while excluding compounds of the formula  $H(n+2)PnO(3n+1)$  (i.e., the phosphoric and polyphosphoric acids).

**389.23 Pentavalent P, except  $H(n+2)PnO(3n+1)$ :**

This subclass is indented under subclass 389.2. Compositions in which the Phosphorus containing compound includes pentavalent Phosphorus, such as phospho and phosphono compounds, while excluding compounds of the formula  $H(n+2)PnO(3n+1)$  (i.e., the phosphoric and polyphosphoric acids).

**389.24 Trivalent P (e.g., phosphorus acid, phosphites, etc.):**

Compositions under subclass 389.2 in which the phosphorus containing compound includes trivalent phosphorous such as phosphorus acid or its salts, the phosphites.

**389.3 Silicon containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of the element silicon.

**389.31 Organo silicon:**

This subclass is indented under subclass 389.3. Compositions in which the silicon containing compound is an organic compound.

SEE OR SEARCH CLASS:

260, Chemistry of Carbon Compounds, the main class definition for the definition of Organic Compounds.

**389.32 Nitrogen containing (e.g., amino, etc.):**

This subclass is indented under subclass 389.31. Composition in which the organic silicon compound further includes an atom of nitrogen.

**389.4 Boron containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of the element boron.

**389.41 Organo boron:**

This subclass is indented under subclass 389.4. Compositions wherein the boron containing compound is an organic compound.

SEE OR SEARCH CLASS:

260, Chemistry of Carbon Compounds, the main class definition for the definition of Organic Compounds.

**389.5 Chromium containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of the element chromium.

**389.51 Lead containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of the element lead.

**389.52 Zinc or aluminum containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of the element zinc or the element aluminum.

**389.53 Nickel, iron, cobalt, copper, manganese, mercury, or cadmium containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of any of the elements nickel, iron, cobalt, copper, manganese, mercury or cadmium.

**389.54 Molybdenum, arsenic, antimony, vanadium, bismuth, tungsten, selenium, or tellurium containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of any of the elements molybdenum, arsenic, antimony, vanadium, bismuth, tungsten, selenium or tellurium.

**389.61 Group IIA metal containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of a group IIA metal (i.e., beryllium, magnesium, calcium, strontium, barium or radium).

**389.62 Alkali metal or NH(4)+ containing:**

This subclass is indented under subclass 389.1. Compositions which include a compound containing an atom of an alkali metal (i.e., lithium, sodium, potassium, rubidium, cesium or francium or NH(4)+).

**390** This subclass is indented under subclass 388. Compositions which contain organic compounds which contain amine, amide, azo, or nitrogen-base radicals.

**391** This subclass is indented under subclass 390. Compositions which contain organic compounds which contain sulfur.

**392** This subclass is indented under subclass 390. Compositions which contain organic compounds which contain oxygen.

**393** This subclass is indented under subclass 388. Compositions which contain organic compounds which contain a phenol or quinone radical (oxygen bonded directly to carbon of a benzene or naphthalene ring or other aromatic nucleus).

**394** This subclass is indented under subclass 388. Compositions which contain organic compounds which contain nitrogen.

**395** This subclass is indented under subclass 388. Compositions which contain organic compounds which contain sulfur.

**396** This subclass is indented under subclass 388. Compositions which contain organic compounds which contain oxygen.

**397** This subclass is indented under subclass 380. Compositions specialized and designed for, or peculiar to, use or in anti-oxidants or agents for preventing, inhibiting, or reducing oxidation, chemical decomposition, or other chemical change.

- (1) Note. For compositions each of which contains a main substance and an agent for inhibiting chemical decomposition or other chemical change of the main substance, search where the main substance is classifiable.

SEE OR SEARCH THIS CLASS, SUBCLASS:

381+, for protective layers.

386, for agents for inhibiting knock or explosions.

387+, for anticorrosion agents.

**398** This subclass is indented under subclass 397. Compositions which contain plant or animal matter, or extracts thereof, of unknown constitutions.

**399** This subclass is indented under subclass 397. Compositions which contain organic compounds.

**400.1 Component inorganic or organic comprising element other than C,H,O,N,S, and halogen:**  
This subclass is indented under subclass 399. Compositions comprising either an inorganic compound or an organic compound which includes an element other than carbon, hydrogen, oxygen, nitrogen, sulfur or a halogen (i.e., fluorine, chlorine, bromine, iodine and astatine).

**400.2 Phosphorus containing:**

This subclass is indented under subclass 400.1. Compositions which includes a compound containing an atom of the element phosphorus.

- (1) Note. This subclass is the location for phosphoric and polyphosphoric acids and ester and other derivatives thereof.

**400.21 Nitrogen or sulfur in phosphorus compound:**

This subclass is indented under subclass 400.2. Compositions in which the compound which includes an atom of phosphorus also includes an atom of the element nitrogen, or the element sulfur.

**400.22 Pentavalent P, but not fully oxygenated:**

This subclass is indented under subclass 400.21. Compositions in which the Phosphorus containing compound includes pentavalent Phosphorus wherein an element other than Oxygen is directly bonded to the Phosphorus.

**400.23 Pentavalent P, but not fully oxygenated:**

This subclass is indented under subclass 400.2. Compositions in which the Phosphorus containing compound includes pentavalent Phosphorus wherein an element other than Oxygen is directly bonded to the Phosphorus.

**400.24 Trivalent P (e.g., phosphorous acid, phosphites, etc.):**

This subclass is indented under subclass 400.2. Compositions in which the phosphorus containing compound includes trivalent phosphorus.

**400.3 Silicon containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of the element silicon.

**400.31 Organo silicon:**

This subclass is indented under subclass 400.3. Compositions in which the silicon containing compound is an organic compound.

SEE OR SEARCH CLASS:

260, Chemistry of Carbon Compounds, the main class definition for the definition of Organic Compounds.

**400.4 Boron containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of the element boron.

**400.41 Organo boron:**

This subclass is indented under subclass 400.4. Compositions wherein the boron containing compound is an organic compound.

SEE OR SEARCH CLASS:

260, Chemistry of Carbon Compounds, the main class definition for the definition of Organic Compounds.

**400.5 Chromium containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of the element chromium.

**400.51 Lead containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of the element lead.

**400.52 Zinc or aluminum containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of the element zinc or the element aluminum.

**400.53 Nickel, iron, cobalt, copper, manganese, mercury, or cadmium containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of any of the elements nickel, iron, cobalt, copper, manganese, mercury or cadmium.

**400.54 Molybdenum, arsenic, antimony, vanadium, bismuth, tungsten, selenium or tellurium containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of any of the elements molybdenum, arsenic, antimony, vanadium, bismuth, tungsten, selenium or tellurium.

**400.61 Group IIA metal containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of a group IIA metal (i.e., beryllium magnesium, calcium, strontium, barium or radium).

**400.62 Alkali metal or NH<sub>4</sub><sup>+</sup> containing:**

This subclass is indented under subclass 400.1. Compositions which include a compound containing an atom of an alkali metal (i.e., lithium, sodium, potassium, rubidium, cesium or francium or NH<sub>4</sub><sup>+</sup>).

- 401** This subclass is indented under subclass 399. Compositions which contain organic compounds which contain amine, amide, azo, or nitrogen-base radicals.
- 402** This subclass is indented under subclass 401. Compositions which contain organic compounds which contain sulfur.
- 403** This subclass is indented under subclass 401. Compositions which contain organic compounds which contain oxygen.
- 404** This subclass is indented under subclass 399. Compositions which contain organic compounds which contain a phenol or quinone radical (oxygen bonded directly to carbon of a benzene or naphthalene nucleus or other aromatic nucleus).
- 405** This subclass is indented under subclass 399. Compositions which contain organic compounds which contain nitrogen.
- 406** This subclass is indented under subclass 399. Compositions which contain organic compounds which contain sulfur.
- 407** This subclass is indented under subclass 399. Compositions which contain organic compounds which contain oxygen.
- 408.1 NONREACTIVE ANALYTICAL, TESTING, OR INDICATING COMPOSITIONS:** This subclass is indented under the class definition. Compositions specialized and designed for, or peculiar to, use in physical analysis, testing or indicating, or as warning agents which do not chemically react in use.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 68, for refrigerants containing warning agents.
- 301.16, for compositions containing fluorescent or phosphorescent substances as analytical, testing, or identification agents.
- SEE OR SEARCH CLASS:
- 48, Gas: Heating and Illuminating, subclass 195 for fuel gases containing warning agents.
- 73, Measuring and Testing, for testing processes and apparatus not otherwise classified.
- 424, Drug, Bio-affecting and Body Treating Compositions, subclasses 9.1+ for a composition adapted to diagnose a body condition or for a method of determining the potency of a composition of that class (424) by a test in a living body.
- 436, Chemistry: Analytical and Immunological Testing, for compositions useful as standards or as materials used in a process of analysis involving a chemical reaction.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (408.1).
- 478** Compositions specialized and designed to prevent the passage of X-radiation or other wave energy, outside the visible spectrum, such as is released in nuclear transformation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 300, for compositions specialized for use as optical filter compositions includ-

ing those which filter ray energy outside the visible spectrum.

**SEE OR SEARCH CLASS:**

- 250, Radiant Energy, subclasses 515.1+ for radiation shields including X-ray shields.
- 378, X-Ray or Gamma Ray Systems or Devices, subclasses 145+ for beam control devices.
- 420, Alloys or Metallic Compositions, subclasses 122.1+ for alloys which are opaque to X-radiation or neutrons.
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 4+ for an X-ray contrast composition to be used in an animal body and subclasses 59+ for a sun or radiation screening composition to be applied to a living body, e.g., sun tanning lotion, etc.
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Class 523, subclass 136 for a composition containing a synthetic resin or natural rubber which is resistant to, yet does not absorb, radioactive materials or cathode rays or to processes of preparing said composition.

**492** This subclass is indented under the class definition. Composition specialized for use in preparing, coating or regenerating incandescent mantles, and mantles defined solely in terms of the composition of which they are composed.

- (1) Note. The term "mantle" is intended to include all devices which are designed to give off light by being heated to incandescence by a combustion flame.
- (2) Note. Included herein are also processes of making mantles which involve no more than preparing or regenerating the composition of which the mantle is composed. For example, this subclass includes processes wherein a textile base is coated or impregnated with a composition classifiable in this subclass and the textile base is then burned off.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 479+, for similar compositions which are claimed as electrodes, filaments and

shields for electric lamps and electric space discharge devices.

**SEE OR SEARCH CLASS:**

- 427, Coating Processes, subclass 159 for coating processes wherein the product is an incandescent mantle.
- 431, Combustion, subclasses 100+ for a burner using a mantle, or for mantle structure.
- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, for a composition comprising a catalyst which may be used in or as an incandescent mantle composition.

**500** This subclass is indented under the class definition. Compositions which either conduct or emit electrons not provided for above.

- (1) Note. This is the residual home for all conductive and emissive compositions and all electrical devices defined solely in terms of their composition with no claimed significant device structure. By way of example only, these devices are electrodes, filaments or shields for electric lamps and electric space discharge devices, welding electrodes, contacts, switches, brushes, and resistances.
- (2) Note. Where the device is claimed in terms of the composition of which it is composed and also in terms of significant device structure, it is classified in the appropriate class providing for such art devices. See the search notes below for such art classes.
- (3) Note. Where a patent contains claims to the electrical device defined only by its composition classified in this or indented subclasses and also claims to a method of preparing such device provided for in another class, the patent is classified in this class (252) and cross-referenced to such other class. See the search notes below for other classes which provide for methods of making electrical devices.
- (4) Note. This and indented subclasses are superior to other composition classes as to coating or plastic compositions useful

in making or coating electrical devices. See Lines With Other Classes and Within This Class, Lines For Particular Class 252 Subclass Areas, for a discussion of the lines between this area and other classes.

- (5) Note. Where the claimed electrically conductive or emissive device is defined in terms of only a single material, it is classified in the appropriate class providing for such material.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 62.2, for electrolytes for electrical devices such as rectifiers and condensers.
- 62.3, for barrier layer device compositions.
- 62.5, for magnetic compositions.
- 62.9, for piezoelectric compositions.
- 181.1+, for compositions specialized for use as getters for electric lamps and electric space discharge devices and for materials and compositions specialized for use in generating a gas or vapor within the container of an electric lamp or electric space discharge device. Where the composition has utility as a getter or gas or vapor generating material within the envelope of an electric lamp or electric space discharge device, and also as an electrode or filament useful for purposes other than gettering or generating a gas or vapor (e.g., emitting electrons), it is classified in subclasses 181.1+ and cross-referenced to subclasses 500+.
- 301.1, for radio-active compositions and materials.
- 301.16, through 301.6, for fluorescent and phosphorescent compositions and materials.
- 502+, for electrically conductive or emissive compositions comprising carbon.
- 570+, for fluent dielectric compositions ("insulating oils") which contain a hydrocarbon and a nonhydrocarbon.

**SEE OR SEARCH CLASS:**

- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Composi-

tions, and Loose Metal Particulate Mixtures, subclasses 228+ for products with a continuous phase of metal made by consolidating metal particles which are electrically conductive or emissive.

- 96, Gas Separation: Apparatus, subclass 95 and 98 for electrode stock material or composite which has been specifically altered, configured, or constructed for use in electric or electrostatic field separation apparatus for gas separation.
- 106, Compositions: Coating or Plastic, appropriate subclasses for miscellaneous coating, impregnating and plastic compositions including electrical insulating compositions. See the (2) Note of the class definition of Class 106, and the reference to this class (252) therein.
- 148, Metal Treatment, subclasses 240+ for processes of treating solid metal with a reactive material to form a coating thereon.
- 200, Electricity: Circuit Makers and Breakers, subclass 166 for contacts and switches wherein there is significant structure of the device claimed whether or not the device is also defined in terms of the composition of which it is composed.
- 204, Chemistry: Electrical and Wave Energy, subclasses 280+ for electrodes and electrode compositions specialized for use in electrolytic apparatus adapted to carry out processes within the scope of Class 204.
- 219, Electric Heating, subclasses 50+ for arc welding and heating of metal. Note particularly indented subclasses 146.1+ for welding electrodes.
- 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses for processes within the class definition, for production of articles which may be disclosed to be electrodes for electrical devices or electrical conductors. In particular, see subclasses 61+ and 104+. Subclasses 165+ pertains to forming of continuous or indefinite length articles, e.g., filamentary products. See subclass 30 for furnace lining forma-



- tion or repair and see the notes thereto.
- 310, Electrical Generator or Motor Structure, subclasses 252+ for electric current conducting brushes wherein there is significant brush structure whether or not the composition of which the brushes are composed is recited.
- 313, Electric Lamp and Discharge Devices, subclass 311 and the subclasses specified in the Notes thereto for discharge devices which have an electrode defined by the composition or material of which it is composed, and subclasses 326+ for filaments, electrodes and shields for electric lamps and electric space discharge devices which are defined by significant structure of the device, whether or not the composition of the device is recited.
- 337, Electricity: Electrothermally or Thermally Actuated Switches, appropriate subclasses for electrothermal and thermally actuated switches with contacts of a particular material or composition of material especially subclasses 270+ and 416+ for particular fusible material.
- 338, Electrical Resistors, appropriate subclasses, for electrical resistors wherein there is significant resistance structure of the device claimed, whether or not the device is also defined in terms of the composition of the element or terminals.
- 373, Industrial Electric Heating Furnaces, subclasses 88+ and 71+ for furnace electrodes and furnace linings, respectively, of specific composition where combined with furnace structure or when defined in terms of significant electrode or lining structure.
- 381, Electrical Audio Signal Processing Systems and Devices, subclasses 179+ for resistance element used in the transmission of sound by means of electricity recited in terms of significant resistant structure.
- 419, Powder Metallurgy Processes, subclass 4 for powder metallurgical methods for producing filaments or fibers.
- 420, Alloys or Metallic Compositions, for single metals and for alloys and metallic compositions.
- 427, Coating Processes, subclasses 58+ for processes of coating, per se, wherein the product is an electrical article.
- 428, Stock Material or Miscellaneous Articles, appropriate subclasses, especially subclasses 375+, 408, 411+, 539.5, 545, 553+, and 615+ for a mere impregnated or coated base which may exhibit electrically conductive and emissive properties. Such coated bases include electrodes, filaments and shields for electric lamps and discharge devices, welding electrodes, resistances, brushes, contacts, wires and electrodes in general which are not specifically provided for elsewhere, or do not include sufficient structure to indicate classification elsewhere.
- 429, Chemistry: Electrical Current Producing Apparatus, Product and Process, subclasses 209+ for battery electrodes.
- 445, Electric Lamp or Space Discharge Component or Device Manufacturing, and the classes specified in the notes thereto for process and apparatus for the manufacture of electrical conductors or emitters such as electrodes or emitters such as electrodes or shields for electric space discharge devices.
- 505, Superconductor Technology: Apparatus, Material, Process, subclasses 100+ for high temperature ( $T_c$  30 K) superconducting materials, per se, or subclasses 300+ for processes of producing same.
- 501.1 Light sensitive:**  
This subclass is indented under subclass 500. Compositions wherein the electrical conductivity or emissivity varies with the intensity of the light to which it is exposed.
- SEE OR SEARCH CLASS:**
- 250, Radiant Energy, the definitions of subclass 200 under (7) Note, for the various classifications of photocells, per se. These generally embody photosensitive compositions or layers.

- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclasses 32+ for compositions of this type limited to use in radiation imagery.
- 502** This subclass is indented under subclass 500. Compositions which contain as an ingredient elemental carbon.
- (1) Note. Where the composition or device is composed of carbon obtained from either plural sources or from natural fibers, the patent is classified in this and indented subclasses.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 510+, for compositions wherein an organic component is present in addition to the elemental carbon, even if the organic component is to be subsequently carbonized in whole or in part.
- SEE OR SEARCH CLASS:
- 201, Distillation: Processes, Thermolytic, appropriate subclasses for a process of carbonizing carbonaceous material.
- 423, Chemistry of Inorganic Compounds, subclasses 445+ for carbon, per se, including manufacturing processes involving a chemical reaction.
- 501, Compositions: Ceramic, subclasses 99+ for refractory composition containing elemental carbon.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclass 901 for a collection of art under the Class definition which discloses subject matter relating to a colloid system comprising substantially pure elemental Carbon in one of its various forms such as graphite, lamp black, carbon black, fullerenes.
- 503** This subclass is indented under subclass 502. Compositions which contain free metal in addition to the elemental carbon.
- 504** This subclass is indented under subclass 502. Compositions which contain a carbide in addition to the elemental carbon.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 516, for other conductive or emissive compositions which contain carbides.
- 505** This subclass is indented under subclass 502. Compositions which contain a radio-active material in addition to the elemental carbon.
- (1) Note. Compounds of radium, uranium and thorium, for example, are included in this subclass.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 301.1, for miscellaneous compositions containing radio-active materials.
- 517, for other conductive or emissive compositions which contain a radio-active material.
- SEE OR SEARCH CLASS:
- 427, Coating Processes, subclass 5 for coating processes, per se, wherein the base or coating is radioactive.
- 506** This subclass is indented under subclass 502. Compositions which contain a metal compound not provided for above in addition to the elemental carbon.
- 507** This subclass is indented under subclass 506. Compositions which contain a titanium or zirconium compound in addition to the elemental carbon.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 519.12, and 520.2+, for other conductive or emissive compositions which contain titanium or zirconium compounds.
- 508** This subclass is indented under subclass 506. Compositions which contain an aluminum compound in addition to the elemental carbon.

- 509** This subclass is indented under subclass 506. Compositions which contain a magnesium, alkaline earth metal or rare earth metal compound in addition to the elemental carbon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 521.1, for other conductive or emissive compositions which contain a rare earth compound.

- 510** This subclass is indented under subclass 502. Compositions which contain an organic component in addition to the elemental carbon.

- (1) Note. Even if the organic component is to be subsequently carbonized, wholly or in part, the composition is classified herein.

- 511** This subclass is indented under subclass 510. Compositions wherein the organic component is a resin (natural or synthetic), a natural rubber or a derivative thereof.

SEE OR SEARCH CLASS:

- 106, Compositions: Coating or Plastic, appropriate subclass for plastic or coating compositions which contain a natural resin and elemental carbon, particularly subclass 241.  
520, Synthetic Resins or Natural Rubbers, appropriate subclasses for synthetic resins or natural rubber and compositions thereof.

- 512** This subclass is indented under subclass 500. Compositions which contain free metals.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 503, for conductive or emissive compositions containing free metal and elemental carbon.

- 513** This subclass is indented under subclass 512. Compositions wherein the free metal is a metal from the iron group.

- (1) Note. The iron group comprises iron, nickel and cobalt.

SEE OR SEARCH CLASS:

- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 246+ for a consolidated metal particle composition having a base of an Iron group, Copper (Cu), or Noble metal.

- 514** This subclass is indented under subclass 512. Compositions wherein the free metal is a noble metal.

- (1) Note. The noble metals as herein provided for are gold, silver, ruthenium, rhodium, palladium, osmium, iridium and platinum.

SEE OR SEARCH CLASS:

- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 246+ for a consolidated metal particle composition having a base of an Iron group, Copper (Cu), or Nobel metal.

- 515** This subclass is indented under subclass 512. Compositions wherein the free metal is tungsten.

SEE OR SEARCH CLASS:

- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclass 248 for a consolidated metal particle composition having a tungsten base.

- 516** This subclass is indented under subclass 500. Compositions which contain a carbide.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 504, for conductive or emissive compositions containing a carbide and elemental carbon.

## SEE OR SEARCH CLASS:

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclass 236 for a consolidated metal particle composition containing carbide.

**517** This subclass is indented under subclass 500. Compositions which contain a radio-active material.

- (1) Note. Compounds of radium, uranium and thorium, for example, are included in this subclass.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

505, for conductive or emissive compositions containing elemental carbon and a radio-active material.

**518.1 Metal compound containing:**

This subclass is indented under subclass 500. Compositions which contain a metal compound not provided for above.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

506+, for conductive or emissive compositions containing a metal compound and elemental carbon.

**519.1 Compound viewed as composition (i.e., wherein atoms or molecules in a chemical formula are not present as whole small integer values or cannot be multiplied by a single-digit factor to yield integer values):**

This subclass is indented under subclass 518.1. Compositions which contain a compound wherein atoms or molecules in a chemical formula are not present as whole small integer values or cannot be multiplied by a factor in the single digit to yield integer values. Such a compound is considered a composition for purposes of this subclass and its indents.

- (1) Note. The electrically conductive compounds provided for herein are regarded as compositions according to the Class 423 class definition (i.e., see Note (13) of Class 423). A mixture of such a com-

pound proper for this subclass with a separate and distinct component is also proper for this subclass.

- (2) Note. Class 505 is superior to Class 423 or Class 252.

## SEE OR SEARCH CLASS:

423, Chemistry of Inorganic Compounds, for an inorganic compound wherein plural elements are present in specifically defined whole integer values.

505, Superconductor Technology: Apparatus, Material, Process, for electrically conducting superconducting compounds or compositions operative above 30 K.

**519.12 Titanium containing:**

This subclass is indented under subclass 519.1. Compositions wherein the chemical formula has titanium therein.

**519.13 Bismuth, ruthenium, or iridium containing:**

This subclass is indented under subclass 519.1. Compositions wherein the chemical formula has bismuth, ruthenium, or iridium therein.

**519.14 Sulfur, tellurium, selenium, nitrogen, phosphorus, or boron containing:**

This subclass is indented under subclass 519.1. Compositions wherein the chemical formula has sulfur, tellurium, selenium, nitrogen, phosphorus, or boron therein.

**519.15 Four diverse metals containing:**

This subclass is indented under subclass 519.1. Compositions wherein the chemical formula has four or more diverse metals therein.

**519.2 Organometallic (e.g., soap, complex, etc.):**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is an organic compound.

- (1) Note. The expression "organic compound" in this and indented subclasses corresponds to the Class 260 class definition (i.e., compounds containing carbon, which are further characterized by the presence in a molecule thereof of (a) two carbon atoms bonded together, (b) one atom of carbon bonded to at least one atom of hydrogen or halogen, or (c)

one atom of carbon bonded to at least one atom of nitrogen by a single or double bond, with the proviso that HCN, CN-CN, HNCO, HNCS, cyanamide, cyanogen halides, fulminic acid, metal carbides, and graphite are excluded from being organic compounds).

**519.21 With additional organic compound:**

This subclass is indented under subclass 519.2. Compositions which contain, in addition to the organometallic compound, an additional organic compound which may itself be organometallic.

SEE OR SEARCH THIS CLASS, SUBCLASS:

510+, for conductive or emissive compositions containing an organic compound and elemental carbon.

**519.3 With organic compound:**

This subclass is indented under subclass 518.1. Compositions which contain an organic compound in addition to the metal compound.

SEE OR SEARCH THIS CLASS, SUBCLASS:

510+, for conductive or emissive compositions containing an organic compound and elemental carbon.

**519.31 The organic compound contains silicon:**

This subclass is indented under subclass 519.3. Compositions wherein the organic compound has at least one silicon atom therein.

**519.32 The organic compound is a natural resin, protein, lignin, carbohydrate, or derivative thereof:**

This subclass is indented under subclass 519.3. Compositions wherein the organic compound is a natural resin, protein, lignin, carbohydrate, or derivative thereof.

- (1) Note. Natural resins include but are not limited to shellac, copals from various sources (e.g., congo, manila, etc.), amber, dammar, dead dammar, gum rosin, japan, japan varnish, rosin (colophony), tall oil (liquid rosin), wood rosin, burgundy pitch, gurjun balsam, canada balsam, sandrac, mastic, accroides, benzoin, elemi, gamboge, gum thus,

venice turpentine, bordeaux turpentine, abietic acid, pimaric acid, etc.

- (2) Note. Examples of derivatives of natural resins included herein are hydrogenated, esterified, polymerized, or sulfurized natural resins, or salts thereof.

- (3) Note. Protein is a naturally occurring polypeptide (polyamide) of more than 100 a-amino acid residues or of molecular weight greater than 10,000.

(4) Note. Lignin is a noncarbohydrate, polymeric substance found in wood and woody plants which functions as a natural plastic binder for the cellulose fibers. It is isolated directly from wood or wood products or from the treatment of wood (e.g., waste sulfite liquor or black liquor). The structure of the lignin monomer is not completely known.

- (5) Note. The term "carbohydrate or derivative" in this subclass corresponds to the Class 536, subclass 1.1 definition (i.e., a carbohydrate is a saccharide whose monomeric units are polyhydroxy monoaldehydes or polyhydroxy monoketones, having the formula  $C_n(H_2O)_n$  (wherein n is five or six), or the corresponding cyclic hemiacetals thereof, or the reaction derivatives thereof in which the product is of indeterminate structure or the carbon skeleton and the carbonyl function or hemiacetal function of the saccharide unit are not destroyed).

**519.33 The organic compound is a polymer:**

This subclass is indented under subclass 519.3. Compositions wherein the organic compound is a large molecule of many repeating units; both liquid and solid polymers are encompassed herein, as are both homopolymeric and copolymeric substances.

- (1) Note. Examples of polymers provided for herein are polyacetylene, polypropylene, epoxy resin, poly(xylylidene), polyester, poly(oxyalkylene), and polyacrylonitrile.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

511, for conductive or emissive compositions containing a resin, rubber, or derivative thereof and elemental carbon.

**519.34 The metal compound contains halogen, sulfur, selenium, phosphorus, arsenic, boron, or nitrogen:**

This subclass is indented under subclass 519.33. Compositions wherein nitrogen, boron, arsenic, phosphorus, selenium, sulfur, or halogen is present in the metal compound.

**519.4 Sulfur, selenium, or tellurium containing:**

This subclass is indented under subclass 518.1. Compositions wherein sulfur, selenium, or tellurium is present in the metal compound.

**519.5 Zinc compound:**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is a zinc compound.

**519.51 Additional diverse metal containing:**

This subclass is indented under subclass 519.5. Compositions wherein an additional diverse metal atom is present in the zinc compound.

**519.52 With boron compound:**

This subclass is indented under subclass 519.5. Compositions which contain a boron compound in addition to the zinc compound.

**519.53 With halogen compound:**

This subclass is indented under subclass 519.5. Compositions which contain a halogen compound in addition to the zinc compound.

**519.54 Silicon containing or with compound of bismuth or silicon:**

This subclass is indented under subclass 519.5. Compositions wherein the zinc compound has at least one silicon atom therein or wherein a bismuth or silicon compound is present in addition to the zinc compound.

**520.1 Tin compound:**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is a tin compound.

**520.2 Titanium or zirconium compound:**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is a titanium compound or a zirconium compound.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

507, for conductive or emissive compositions containing a titanium or zirconium compound and elemental carbon.

**520.21 Additional diverse metal containing:**

This subclass is indented under subclass 520.2. Compositions wherein an additional diverse metal atom is present in the zirconium compound or in the titanium compound.

**520.22 Boron, silicon, phosphorus, nitrogen, hydrogen, carbon, or halogen containing:**

This subclass is indented under subclass 520.2. Compositions wherein boron, silicon, phosphorus, nitrogen, hydrogen, carbon, or halogen is present in the titanium compound or in the zirconium compound.

**520.3 Silver, gold, or platinum compound:**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is a silver compound, a gold compound, or a platinum compound.

**520.4 Vanadium compound:**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is a vanadium compound.

**520.5 Tungsten or yttrium compound:**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is a tungsten compound or an yttrium compound.

**521.1 Rare earth metal compound:**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is a rare earth metal compound.

- (1) Note. The rare earth metals are lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), promethium (Pm), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er),

thulium (Tm), ytterbium (Yb), and lutetium (Lu).

SEE OR SEARCH THIS CLASS, SUBCLASS:

509, for conductive or emissive compositions containing a rare earth metal compound and elemental carbon.

**521.2 Iron, cobalt, or nickel compound:**

This subclass is indented under subclass 518.1. Compositions wherein the metal compound is an iron compound, a cobalt compound, or a nickel compound.

**521.3 Silicon containing or with silicon compound:**

This subclass is indented under subclass 518.1. Compositions wherein silicon is present in the metal compound or wherein a silicon compound is present in addition to the metal compound.

**521.4 Boron containing or with boron compound:**

This subclass is indented under subclass 518.1. Compositions wherein boron is present in the metal compound or wherein a boron compound is present in addition to the metal compound.

**521.5 Halogen, carbon, phosphorus, or nitrogen containing:**

This subclass is indented under subclass 518.1. Compositions wherein halogen, carbon, phosphorus, or nitrogen is present in the metal compound.

**521.6 With nonmetal compound containing halogen, nitrogen, phosphorus, or sulfur:**

This subclass is indented under subclass 518.1. Compositions which have, in addition to the metal compound, a nonmetal compound containing halogen, nitrogen, phosphorus, or sulfur.

**567 DEFINED LIQUID DIELECTRIC DISPERSED IN DEFINED WEB OR SHEET:**

This subclass is indented under the class definition. Subject matter wherein a self-sustaining web or sheet, defined in terms of its composition, has distributed therein a material, liquid at ambient temperatures, which also is claimed in terms of its composition and which has indicated electric insulating properties.

(1) Note. According to current PTO practice, a single-layer web or sheet uniformly impregnated or swelled with another material is considered to be a composition, rather than a stock material.

(2) Note. The composition of the web or sheet itself must be claimed in terms which indicate the presence of at least one periodic-table group or atom other than carbon. Such terms as "cellulosic", "silicic", "halogen", etc., are sufficiently definite as to composition of the web or sheet to be classified in this subclass (567). When the web or sheet is identified only in broad, functional, or property terms such as "substrate", "fibrous", "plastic", "porous", "organic", "metallic", "dielectric", etc., and the liquid component is described in terms of its composition and is either claimed or disclosed as having such property as its sole utility, classification is not proper herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

570+, for a fluent dielectric composition, per se, and for situations wherein the web or sheet is identified only in broad, functional, or property terms such as "substrate", "fibrous", "plastic", "porous", "organic", "metallic", "dielectric", etc., and the liquid composition is described in terms of its composition and is either claimed or disclosed as having such property as its sole utility, see the notes thereto for the location of other electrically insulating compositions.

SEE OR SEARCH CLASS:

106, Compositions: Coating and Plastic, appropriate subclasses for nonresinous plastic web or sheet impregnated with a solid dielectric or liquid dielectric impregnant which is not claimed in terms of its composition or which is not claimed or solely disclosed as a dielectric.

- 162, Paper Making and Fiber Liberation, subclasses 103+ and 123+ for multilayer materials, including a layer of paper, which may be impregnated with another material; subclasses 135+ for a single layer of paper which may contain a solid dielectric impregnant or a liquid dielectric impregnant which is not claimed in terms of its composition or which is not claimed or solely disclosed as a dielectric; and subclass 138 for a paper layer having an electrical characteristic.
- 427, Coating Processes, appropriate subclasses for a method of impregnating.
- 428, Stock Material or Miscellaneous Articles, subclasses 260+ for fabric impregnated with a solid dielectric or a liquid dielectric impregnant which is not claimed in terms of its composition or which is not claimed or solely disclosed as a dielectric; and subclasses 411+ for a multilayer material which may have electric insulating properties.
- 521, Synthetic Resins or Natural Rubbers, subclasses 53+ for a preformed porous or cellular synthetic resin impregnated with a solid dielectric or a liquid dielectric impregnant which is not claimed in terms of its composition or which is not claimed or solely disclosed as a dielectric.

#### 570 FLUENT DIELECTRIC:

This subclass is indented under the class definition. Nonsolid claimed as a nonconductor of electricity.

- (1) Note. A nonsolid is a material which, at ambient temperatures, does not hold its shape without confinement. Most solid nonmetal compositions ordinarily are electrical insulators and classification of such construction materials on the basis of electrical properties has been found impractical; therefore, another way of defining "fluent" in this context is as any composition which cannot be accommodated in Class 106 or the Class 520 series. A mass of particulate solids is not considered fluent for purposes of this subclass, but a "slumpable" nonparticu-

late material, e.g., a grease, etc., is considered fluent.

- (2) Note. Where a patent claims an electrical device containing a dielectric, the patent is classified with the device, no matter how nominal the recitation of the device may be.

#### SEE OR SEARCH THIS CLASS, SUBCLASS:

- 71+, for heat exchange, low-freezing or low-pour-point or high-boiling-point compositions, which compositions may have electrical insulating properties.
- 500+, for nonmetal compositions which, under some or all circumstances, conduct electricity, including electric "resistance" elements having a defined conductivity, even though the conductivity is small.

#### SEE OR SEARCH CLASS:

- 106, Compositions: Coating or Plastic, for normally solid inorganic, organic nonresinous, and organic natural-resin solid materials, or materials which solidify upon "setting", whether described and/or claimed as electric insulators or not.
- 174, Electricity: Conductors and Insulators, subclasses 8+ for such subject matter which includes a fluid; subclasses 110+ for an insulated conductor, even when the conductor is only nominally claimed; and subclasses 137+ for a shaped insulator.
- 208, Mineral Oils, Processes and Products, subclass 14 for electrically insulating compositions, consisting entirely of mineral oil components.
- 218, High-Voltage Switches With Arc Preventing and Extinguishing Devices, subclasses 89+ for such subject matter having an interposed nonconductor.
- 219, Electric Heating, subclasses 538+ for an insulated electric heating element.
- 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, especially subclasses 56+ and 109+ for methods of making articles by uniting randomly associated particles.



- 313, Electric Lamp and Discharge Devices, appropriate subclasses for such devices containing an insulating material.
- 336, Inductor Devices, for electric voltage transformers of this type, especially subclass 94 for such a device having fluid insulation.
- 338, Electrical Resistors, appropriate subclasses for such subject matter including a dielectric material.
- 361, Electricity: Electrical Systems and Devices, subclasses 301.1+ for a fixed capacitor (condenser) which may include a named dielectric.
- 501, Compositions: Ceramic, appropriate subclasses for ceramic compositions capable of functioning as an electrical insulator.
- 508, Solid Antifriction Devices, Materials Therefor, Lubricant and Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, particularly subclasses 110+, for lubricants and miscellaneous compositions containing a mineral oil and a nonhydrocarbon additive, including compositions claimed as having both lubricating and electric insulating properties.
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for a nonfluent composition containing a synthetic resin or natural rubber which composition has the property of insulating objects electrically from each other.
- 523, Synthetic Resins or Natural Rubbers, subclass 173 for a synthetic resin or natural rubber composition having utility as a filling or flooding composition for cables or to processes of preparation thereof.
- 585, Chemistry of Hydrocarbon Compounds, subclasses 6.3+ for an "insulating oil" composition consisting only of hydrocarbons where at least one of the components is not a mineral oil.
- 571 Gaseous or gas-containing:**  
This subclass is indented under subclass 570. Subject matter wherein the composition is one which has a volume the size of the container which holds it or is a liquid containing a defined gaseous component.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:**  
372, for miscellaneous gaseous compositions.
- SEE OR SEARCH CLASS:**  
48, Gas: Heating and Illuminating, appropriate subclasses for gaseous compositions set forth for such uses.  
585, Chemistry of Hydrocarbon Compounds, subclass 6 for gaseous compositions comprising hydrocarbons only.
- 572 Metal- or insoluble component-containing; e.g., slurry, grease, etc.:**  
This subclass is indented under subclass 570. Subject matter wherein the fluent material contains a metal, a metal compound or a component which does not dissolve in the fluent material.
- (1) Note. The composition must maintain its fluent properties that is, its ability to change its shape under a minimum-stress force, such as gravity.
- 573 Si-containing:**  
This subclass is indented under subclass 570. Subject matter wherein the fluent material contains silicon in elemental or combined form.
- 574 B-, P-, S-, Se- or Te-containing:**  
This subclass is indented under subclass 570. Subject matter in which a component of the component contains boron, phosphorus, sulfur, selenium, or tellurium.
- 575 N-containing:**  
This subclass is indented under subclass 570. Subject matter in which a component of the composition contains nitrogen.
- 576 O in N compound:**  
This subclass is indented under subclass 575. Subject matter in which a single discrete compound contains both oxygen and nitrogen.
- (1) Note. Where a component is described as the "reaction product" of an oxygen-containing material and a nitrogen-con-

taining material it is assumed that the reaction product is or contains a compound having both N and O.

**577 Nitro or nitroso compound:**

This subclass is indented under subclass 576. Subject matter having the =N=O moiety, characteristic of nitro and nitroso compounds.

**578 O-containing:**

This subclass is indented under subclass 570. Subject matter in which a component of the composition contains oxygen.

**579 Carboxylic acid ester:**

This subclass is indented under subclass 578. Subject matter having the group, as illustrated below, characteristic of the reaction product of a carboxylic acid and an alcohol. R--O-R'

- (1) Note. The ester, e.g., a vegetable oil, may be the major component of the composition.

**580 Halogen-containing:**

This subclass is indented under subclass 578. Subject matter in which a component of the composition contains fluorine, chlorine, bromine or iodine.

SEE OR SEARCH THIS CLASS, SUBCLASS:

570, and 581, for an electrically insulating fluid which contains halogen, but not oxygen.

**581 Halogenated polycyclic compound-containing:**

This subclass is indented under subclass 570. Subject matter which contains an organic material comprised of more than one carbocyclic ring, the organic material also containing fluorine, chlorine, bromine or iodine.

**582 LIGHT TRANSMISSION MODIFYING COMPOSITIONS:**

This subclass is indented under the class definition. Compositions used usually in various optical applications which change light and visible solar radiations (including infrared and ultraviolet) transmittance properties when exposed to energy, usually visible radiation.

- (1) Note. This subclass includes compositions specialized for use as optical filters or as coatings which have optical filtering properties, as well as optical filters defined solely in terms of their composition with no claimed significant filter structure.

- (2) Note. Where the filter is claimed in terms of the composition of which it is composed and also in terms of significant filter structure, it is classified in the appropriate class providing for such structure and cross-referenced to this subclass (582). See the search notes below.

- (3) Note. Where the claimed filter is defined in terms of only a single material and no significant filter structure is recited, it is classified in the appropriate class providing for such material.

SEE OR SEARCH CLASS:

- 106, Compositions: Coating or Plastic, subclasses 47+ for glass compositions which have optical filtering properties.
- 204, Chemistry: Electrical and Wave Energy, especially subclasses 157.15+ for processes making photochromic material (other than coating) involving chemical reaction brought about by wave energy.
- 359, Optics: Systems (Including Communication) and Elements, subclasses 350+, 885+, and the classes specified in the notes thereto, for devices which include as part thereof an optical filter and for optical filters, per se, which are claimed in terms of significant filter structure.
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 59 for cosmetic compositions performing a filtering function, e.g., suntan lotions.

- 583 Modification caused by energy other than light:**  
This subclass is indented under subclass 582. Composition wherein the transmission property change is occasioned by use of energy other than light, e.g., heat, electricity, etc.
- 584 Inorganic crystalline solid:**  
This subclass is indented under subclass 582. Composition in the form of an inorganic crystalline solid material.
- 585 Producing polarized light:**  
This subclass is indented under subclass 582. Composition which polarize light passing therethrough.
- 586 Displaying color change:**  
This subclass is indented under subclass 582. Composition which modify the transmission property by changing color.
- 587 Infrared:**  
This subclass is indented under subclass 582. Composition which affect the transmission of infrared rays.
- 588 Ultraviolet:**  
This subclass is indented under subclass 582. Composition which affect the transmission of ultraviolet rays.
- 589 Organic material:**  
This subclass is indented under subclass 588. Composition which are organic substances.
- 600 RADIATION SENSITIVE:**  
This subclass is indented under the class definition. Compositions which are designed to be responsive to radiation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
62.3+, for barrier device compositions.  
62.5+, for magnetic compositions.  
299, for liquid crystal compositions.  
301.1+, for radioactive compositions.  
301.36, for inorganic luminescent compositions with organic nonluminescent material.  
301.4+, for inorganic luminescent compositions.
- 500+, for electrically conductive or emissive compositions.
- SEE OR SEARCH CLASS:  
430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, appropriate subclasses for radiation sensitive compositions limited to radiation imagery.  
501, Compositions: Ceramic, subclass 13 for glass compositions which are photochromic and for processes of making such compositions.  
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art; including those instances when a composition would otherwise be proper for this subclass (600).  
520, Synthetic Resins or Natural Rubbers, appropriate subclasses for a composition containing a synthetic resin or natural rubber which is radiation sensitive and which utility is not provided for in any other class or in any special use or function area in Class 252.

**601 FIRE RETARDING:**

This subclass is indented under the class definition. Compositions specialized and designed for use in treating materials to make them less combustible or more resistant to fire.

SEE OR SEARCH THIS CLASS, SUBCLASS:

380+, for preservative agents in general.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 115.5+ for use of a fire-retarding composition to chemically modify a textile or fiber.

106, Compositions: Coating or Plastic, particularly subclasses 15.05+ for compositions, e.g., paints or varnishes which when applied to surfaces, set or harden to form hard tenacious films, even if such compositions include a fireproofing agent or are inherently fireproofing.

162, Paper Making and Fiber Liberation, subclass 159 for fireproofing agent used in the process or product of the class.

169, Fire Extinguishers, subclass 45 for process of preventing fire by use of a fire-retarding composition.

424, Drug, Bio-Affecting and Body Treating Compositions, appropriate subclasses for a biocidal composition which may also be fireproofing.

427, Coating Processes, appropriate subclasses for coating a fire-retarding composition and treating the same.

428, Stock Material or Miscellaneous Articles, appropriate subclasses for a stock material product in the form of a single or plural layer web or sheet; see especially subclasses 276+ for such a product embodying mechanically interengaged strands or strand portions of a cellulosic material, impregnated with a phosphorus compound and having fire resistant or retardant features; and subclass 921 (a cross-reference art collection) for a product having fire or flame proof features.

520, Synthetic Resins or Natural Rubbers, appropriate areas for compositions containing synthetic resin or natural rubber which, when applied to surfaces, set or harden to form hard tenacious adherent films, even if such compositions include a fireproofing agent or are inherently fireproofing. See Lines With Other Classes and Within This Class, for a general outline of subject matter of the Class 520 series.

**602 Having disparate function:**

This subclass is indented under subclass 601. Compositions performing a function other than fire retardation, e.g., waterproofing, corrosion resistance, etc.

**603 For living matter:**

This subclass is indented under subclass 601. Compositions used to retard the burning of living plant matter, e.g., trees, grass, etc.

**604 Material physically quantified:**

This subclass is indented under subclass 601. Compositions having material defined by dimensions, crystal structure, X-ray diffraction, etc.

**605 Containing a gas:**

This subclass is indented under subclass 601. Compositions having a nonliquid fluid as a part thereof.

**606 Intumescent:**

This subclass is indented under subclass 601. Compositions which swell under heat or direct flame to produce a puffed-up, nonglowing insulating cellular mass which insulates the substrate from the heat source and at the same time excludes oxygen.

**607 For wood or cellulosic material other than textile:**

This subclass is indented under subclass 601. Compositions designed to be used with wood or cellulosic matter other than textile.

SEE OR SEARCH THIS CLASS, SUBCLASS:

608, for cellulosic textiles.

609, for solid synthetic polymers and reactants thereof.

**608 For textile (i.e., woven material:**  
This subclass is indented under subclass 601. Compositions for rendering woven material fire retardant.

**609 For solid synthetic polymer and reactants thereof:**  
This subclass is indented under subclass 601. Compositions designed for use with solid synthetic polymers and reactants of the same.

**610 For dispersion or colloidal system:**  
This subclass is indented under subclass 601. Compositions comprising systems of minute particles distinct and separate from one another and suspended in a medium.

**SEE OR SEARCH CLASS:**

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

**611 For dispersion or colloidal system:**  
This subclass is indented under subclass 610. Compositions designed to be incorporated into a dispersion or colloidal system.

**SEE OR SEARCH CLASS:**

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes

of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

**625 RADIOACTIVE COMPOSITIONS:**

This subclass is indented under the class definition. Compositions which contain a substance which is spontaneously radioactive and processes pertaining to same.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

505, and 517, for conductive or emissive compositions containing radioactive matter and electrical devices defined only in terms of their composition.

**SEE OR SEARCH CLASS:**

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 84+ for processes of preparing radioactive and actinide series metals; subclass 235 for a composition having a continuous phase of free metal made by consolidating metal particles and having an oxide of aluminum, a Group IIA, IIIB or Group IVB metal; and subclass 84.1 for such composition having a base of a transition metal.

- 148, Metal Treatment, subclass 560 for processes of significant heating of solid or semi-solid actinide or trans-actinide metal to modify or maintain the internal physical structure (i.e., microstructure) or chemical property of the metal.
- 164, Metal Founding, subclass 450.2 for a metal casting apparatus having control means influenced by a radioactive sensor and which may include a radioactive source.
- 250, Radiant Energy, subclasses 303+ for radioactive tracer processes; subclass 308 for the inspection of solids or liquids by radioactive charged particles; subclass 379 for electric signalling devices including a radioactive gas or gas-borne radioactive particles or a radioactive source; subclass 384 for gas discharge signalling devices responsive to radiation from radioactive sources; subclasses 462.1+ for self-luminous articles; and subclasses 493.1+ for radiant energy generation and sources, including subclasses 496.1+ for contained radioactive sources.
- 313, Electric Lamp and Discharge Devices, subclass 54 for electrical lamps and electric space discharge devices (e.g., radio tubes) which include a radioactive substance as a part thereof.
- 376, Induced Nuclear Reactions: Processes, Systems, and Elements, appropriate subclasses for the production of radioactive compositions by irradiation.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclass 159 for apparatus for radioactive reactant or product.
- 423, Chemistry of Inorganic Compounds, subclasses 2+ and 249+ for radioactive compounds, per se, including manufacturing processes involving a chemical reaction.
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 1.11+ for class defined compositions and methods comprising a radionuclide or intended radionuclide (e.g., in vivo testing).
- 427, Coating Processes, subclass 5 and 6 for coated articles containing a radioactive material.
- 428, Stock Material or Miscellaneous Articles, subclasses 411+ for composite web or sheet characterized merely by composition, one of which layers may contain radioactive material.
- 976, Nuclear Technology, subclasses D277+, Dig. 375+, and Dig. 403+, for an alternative search based on a modification of the European Patent Office Classification.
- 634 In form of sol solution or gel:**  
This subclass is indented under subclass 625. Subject matter comprising an aqueous or organic liquid containing dissolved or dispersed radioactive matter.
- SEE OR SEARCH THIS CLASS, SUBCLASS:**  
302+, for nonradioactive colloids.  
637+, particularly 640, for nuclear reactor fuel material dissolved or dispersed in a nonaqueous, nonorganic liquid, i.e., liquid metal.
- SEE OR SEARCH CLASS:**  
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols\*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically supe-

rior provision in the USPC for the specifically claimed art.

**635 Including production of solid particles by chemical reaction:**

This subclass is indented under subclass 634. Subject matter wherein the liquid is treated by a process which includes a chemical reaction, other than simple precipitation, to produce a solid particle.

SEE OR SEARCH CLASS:

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclass 0.5 for forming radioactive materials by physical processes.

**636 Nuclear reactor fuel:**

This subclass is indented under subclass 625. Subject matter used as a fuel for a nuclear reactor including thermonuclear (fusion) reactors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

634, for aqueous or organic sols or solutions suitable for use as a nuclear reactor fuel.

SEE OR SEARCH CLASS:

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 84.1+ for pyrometallurgy of actinide and transactinide elements.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, for methods of shaping or nonchemical reactive treating of radioactive material.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, for nuclear reactor fuel defined by structure.

423, Chemistry of Inorganic Compounds, subclasses 249+ for actinide compounds useful as a nuclear reactor fuel.

427, Coating Processes, subclass 6 for coating nuclear fuel elements.

**637 Actinide having nonactinide component:**

This subclass is indented under subclass 636. Compositions containing an actinide containing component and a nonactinide component.

(1) Note. In this and indented subclasses, burnable poisons are classified by the form in which they appear in the final product.

SEE OR SEARCH THIS CLASS, SUBCLASS:

638, for boron oxide.  
640, for metal borides.

**638 Oxide component:**

Compositions under subclass 637 wherein the nonactinide containing component is an inorganic oxide.

SEE OR SEARCH THIS CLASS, SUBCLASS:

639, for nuclear reactor fuel composition containing an actinide component and an organic oxygen containing compound.

**639 Carbon containing component:**

This subclass is indented under subclass 637. Compositions wherein the nonactinide element containing component contains carbon, including elemental carbon, inorganic carbides, and organic compounds.

**640 Free metal or metal compound component:**

This subclass is indented under subclass 637. Compositions wherein the nonactinide element containing component is a free metal or a metal compound.

SEE OR SEARCH THIS CLASS, SUBCLASS:

638, for nuclear reactor fuel having metallic oxide including ceramic material.  
639, for nuclear reactor fuel having a metallic carbide.

SEE OR SEARCH CLASS:

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Composi-

tions, and Loose Metal Particulate Mixtures, subclasses 201+ for cermet nuclear reactor fuels.

**641 Actinide nitrides only:**

This subclass is indented under subclass 636. Compositions in which the nuclear fuel contains only nitrides of plural actinide elements.

SEE OR SEARCH THIS CLASS, SUBCLASS:

637, for nuclear reactor fuels containing actinide oxynitrides or carbonitrides.

SEE OR SEARCH CLASS:

423, Chemistry of Inorganic Compounds, subclasses 249+ for actinide nitrides, per se.

**642 Actinide carbides only:**

This subclass is indented under subclass 636. Compositions wherein the nuclear reactor fuel contains only carbides of plural actinide elements.

SEE OR SEARCH THIS CLASS, SUBCLASS:

637, for nuclear reactor fuels containing actinide oxycarbides or carbonitrides.

SEE OR SEARCH CLASS:

423, Chemistry of Inorganic Compounds, subclasses 249+ for actinide carbides, per se.

**643 Actinide oxides only:**

This subclass is indented under subclass 636. Compositions wherein the nuclear fuel consists only of oxides of plural actinide elements.

SEE OR SEARCH THIS CLASS, SUBCLASS:

637, for nuclear fuels containing actinides oxycarbides or oxynitrides.

SEE OR SEARCH CLASS:

423, Chemistry of Inorganic Compounds, subclasses 260+ for uranium oxides.

**644 As a source of radiation or heat:**

This subclass is indented under subclass 625. Compositions undre ... which are used as a source of alpha, beta, or gamma rays, and neu-

tron or electron beams, all of which may be used for the heat generated by the same.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclasses 492+ for radiation sources with definite claimed structure, and see the search notes thereunder.

**645 For tracing, tagging, or testing:**

This subclass is indented under subclass 644. Compositions adapted to mark, label, etc., that to which it is added, in such a manner that the radioactive component may be (a) detected over a period of time or through a system, and (b) used as means of performing a measurement, indication, etc., and the marked or labelled composition.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclasses 253+ for geological testing or irradiation; subclasses 302+ for radiation trace methods; subclass 308 for inspection of solids or liquids by charged radioactive materials; and subclass 432 for parent daughter isotopes.

423, Chemistry of Inorganic Compounds, subclass 230 for analytical and analytical control processes involving measurements of radioactivity or isotope distribution.

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 1.11+ for class defined compositions and methods comprising a radionuclide or intended radionuclide (e.g., in vivo testing).

600, Surgery, subclasses 407+ for diagnostic testing involving detection of nuclear radiation.

**646 Luminescent:**

This subclass is indented under subclass 625. Subject matter containing matter having the property of emitting light or analogous rays as a result of irradiation by wave energy radiated by some other source.

SEE OR SEARCH THIS CLASS, SUBCLASS:

301.16+, 301.36 and 301.4+, for fluorescent or phosphorescent compositions.



- 644, for compositions which emit nonvisible or high energy rays.
- 647 Laser:**  
This subclass is indented under subclass 646. Subject matter used in a laser apparatus or process.
- 700 CHEMILUMINESCENT:**  
Compositions which contain a mixture or association of two or more substances chosen for eventual chemical interaction thereof to produce chemiluminescence, substances peculiar thereto, and processes of making the same.
- CROSS-REFERENCE ART COLLECTIONS**
- 950** Cross-reference collection directed to materials which supply a foreign substance for incorporation, in very minor, "impurity" amounts, in an element, compound or composition to impart a desired property thereto.
- SEE OR SEARCH THIS CLASS, SUBCLASS:**  
62.3, for barrier layer device compositions and processes for making them, which processes usually include doping.
- SEE OR SEARCH CLASS:**  
206, Special Receptacle or Package, subclasses 524+ for a package containing a chemical.  
420, Alloys or Metallic Compositions, subclass 590 for general processes of preparing alloys.  
438, Semiconductor Device Manufacturing: Process, subclasses 542+ for processes of diffusing a conductivity modifying dopant into a semiconductor region.
- 951** This subclass is indented under subclass 950. Materials designed for conveying the foreign substance as a gas or vapor or entrained in a gas vapor.
- SEE OR SEARCH THIS CLASS, SUBCLASS:**  
181.1+, for getters or gas vapor generating materials for electric lamps, electric space discharge devices and similar devices.
- 960 SURFACE FLAW DETECTING COMPOSITIONS:**  
Art collection related to compositions used for detecting surface cracks or roughness.
- 961 STRESS OR CONTACT INDICATORS:**  
Art collection relating to compositions for indicating physical stress or physical contact.
- 962 TEMPERATURE OR THERMAL HISTORY:**  
Art collection relating to compositions for indicating temperature or thermal history.
- 963 HUMIDITY OR MOISTURE INDICATORS:**  
Art collection relating to compositions indicating water.
- 964 LEAK DETECTION:**  
Art collection of material related to physical indication of leaks.
- 965 RETROSPECTIVE PRODUCT IDENTIFICATION (E.G., TAGS AND TRACERS, ETC.):**  
This subclass is indented under the class definition. Art collection providing information about the source or the ... drawn to rheo-casting.
- FOREIGN ART COLLECTIONS**
- The definitions for FOR 100-FOR 104, FOR 113, and FOR 247-FOR 250 below correspond to the definitions for only the following abolished subclasses under Class 252 from which these collections were formed: 8.6, 8.7, 8.75, 8.8, 8.9, 88, and 367-370. See the Foreign Art Collection schedule for specific correspondences. [Note: The titles and definitions for *indented* art collections include all the details of the one(s) that are hierarchically superior.]
- FOR 100**  
Foreign Art Collections including compositions for treating textile materials not more specifically provided for elsewhere, such as, for example, compositions for oiling or lubricating, rendering antistatic, softening, and silk-soaking, excepting detergent, bleaching and mere wetting compositions.
- FOR 101**

Foreign Art Collections including compositions which comprise organic compounds containing a sulfoxy group, i.e., a radical containing sulfur bonded to at least one oxygen.

**FOR 102**

Foreign Art Collections including compositions which also contain an amine or amide group.

**FOR 103**

Foreign Art Collections including compositions which comprise organic compounds containing an amine or amide group.

**FOR 104**

Foreign Art Collections including compositions which comprise organic compounds containing an ether group, i.e., having the type formula R-O-R.

**FOR 113**

Foreign Art Collections including compositions specialized and designed for, or peculiar to, use in sweeping, or which are adapted to take up, lay or collect dust or other particulate matter by adherence.

**FOR 247**

Foreign Art Collections including compositions which contain alkali-metal salts of water-insoluble fatty or rosin (abietic) acids or processes of making such salts.

**FOR 248**

Foreign Art Collections including products under this hierarchy.

**FOR 249**

Foreign Art Collections including processes which include saponification.

END